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OBSTETRICS

FOR

NURSES

BY

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TENTH EDITION, THOROUGHLY REVISED

PHILADELPHIA AND LONDON

W. B. SAUNDERS COMPANY

1934

Copyright, 1904, by W. B. Saunders and Company. Reprinted October, 1904. Revised, reprinted, and recopyrighted July, 1906. Reprinted February, 1907, and November, 1907. Revised, reprinted, and recopyrighted June, 1908. Reprinted January, 1909, June, 1909, January, July, and October, 1910, March, August, and November, 1911. Reprinted March, 1912, October, 1912, and February, 1913. Revised, entirely reset, reprinted, and recopyrighted July, 1913. Reprinted August, 1914, November, 1914, January, 1915, August, 1915, September, 1915, March, 1916, and October, 1916. Revised, reprinted, and recopyrighted July, 1917. Reprinted March, 1918, March, 1919, March, 1920, October, 1920, January, 1921, and July, 1921. Revised, entirely reset, reprinted, and recopyrighted July, 1922. Reprinted August, 1923. Revised, entirely reset, reprinted, and recopyrighted January, 1924. Reprinted March, 1925, and March, 1926. Revised, reprinted, and recopyrighted March, 1927. Reprinted June, 1928, June, 1929, and January, 1930. Revised, entirely reset, reprinted, and recopyrighted April, 1930. Reprinted April, 1931. Revised, reprinted, and recopyrighted May, 1933

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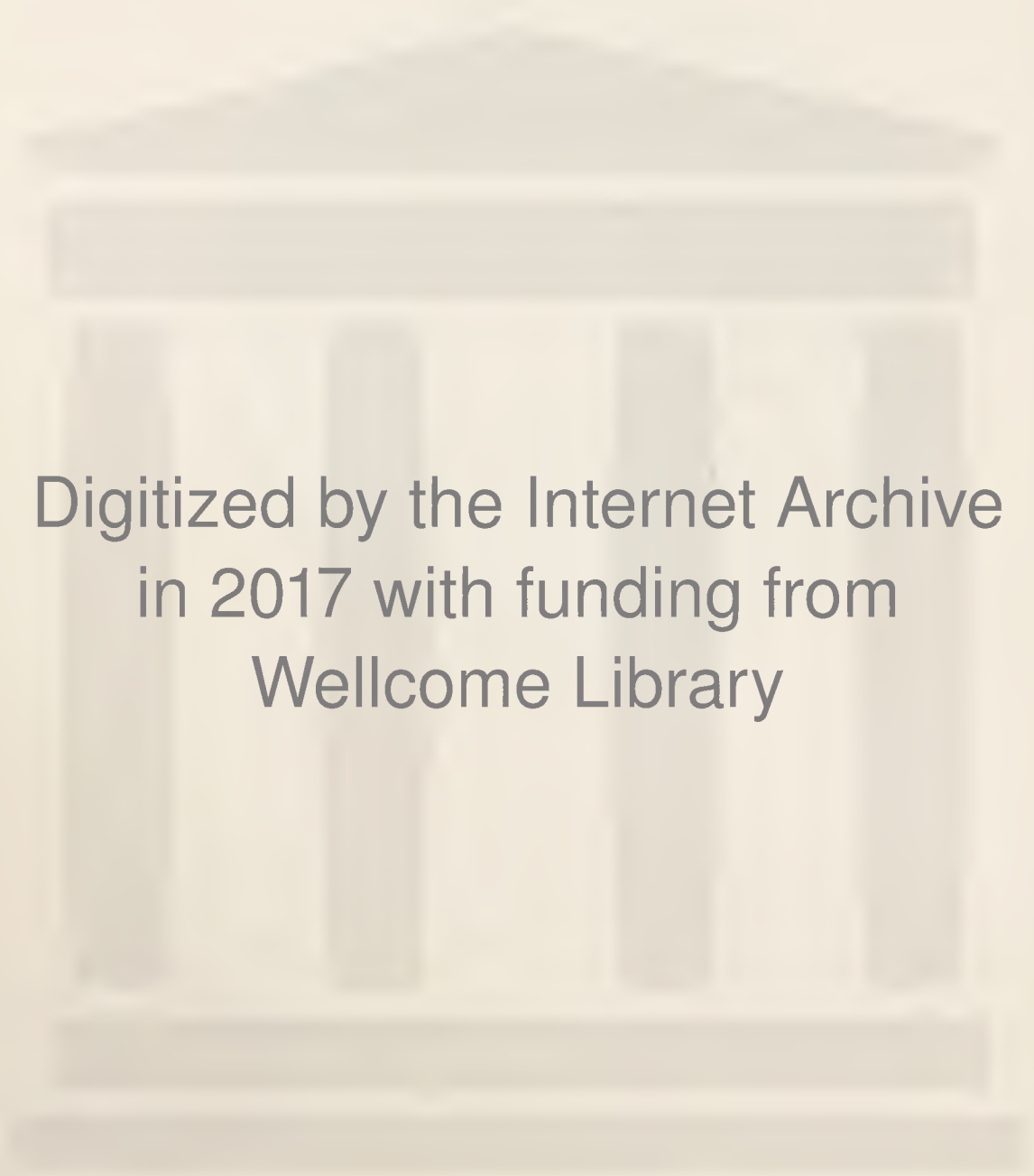
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PHILADELPHIA



TO

“THE WOMAN ABOUT TO BECOME A MOTHER
OR WITH THE NEWBORN INFANT UPON HER BOSOM,
WHEREVER SHE BEARS HER TENDER BURDEN,”
THIS BOOK IS RESPECTFULLY DEDICATED.



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PREFACE TO THE TENTH EDITION

OBSTETRIC nursing moves forward with obstetric medicine. In this the tenth edition of my book for nurses I have sought to keep abreast of all advances in obstetric nursing technic, and have also increased the pages devoted to purely scientific matters.

The new Aschheim-Zondek test for pregnancy is described and the latest theories of hormonal activity mentioned.

Some old illustrations were redrawn and several new ones added.

Dr. George W. Kosmak's Syllabus for Teaching Obstetrics was kept in mind—but the book was made more complete than this so that it would be useful to the advanced nurse and the teacher, as well as the pupil nurse.

As always the emphasis is placed on the care of obstetrics in the home. Two million one hundred thousand babies are born in the United States every year, and 1,500,000 are born in their own homes. Therefore while hospital methods are fully described, those needful in the home receive more particular notice.

Dr. Arthur F. Abt of Chicago kindly revised and amplified the chapter on Infant Feeding, giving the very latest advances in this art.

It is now twenty-nine years since the first edition of this work appeared and I am grateful to the nursing profession for the cordial reception it received at that time, and for the numerous expressions and evidences of good will and loyalty that have been given me throughout this long period.

JOSEPH B. DELEE.

5028 ELLIS AVENUE,
CHICAGO, ILL.,

PREFACE TO THE SEVENTH EDITION

IN preparing this, the seventh edition of his work for nurses, the author has followed the same general lines of the previous ones, but, permitted by the generosity of the publishers to increase both the matter and the illustrations, he has expanded many of the subjects presented before and has added a few new ones. Accordingly, the reader will find, among others, the chapters on the Anatomy and Physiology of the Reproductive Function enlarged. These will meet the requirements of the Board of Nurse Examiners, yet due regard is paid to the fact that this is a book on Obstetric Nursing and that a full presentment of these subjects belongs elsewhere.

There is a great and commendable increase in the respect being paid the pregnant woman throughout the country, and a rounded system of Prenatal Care is being developed. Twenty-five pages have therefore been devoted to this subject.

The importance of diet in health and disease is now gaining that attention of the physician which it has long deserved. Diet influences the well-being of the gravida and the growing fetus and has a direct bearing on the nutrition of the newborn baby. With this in mind the chapter on diet in pregnancy has been amplified and brought up to date.

Since the prime causes of maternal and fetal mortality and morbidity are puerperal infection, the toxemias, and complicated labor, these subjects have also been expanded and the duties and opportunities of the nurse more fully set forth. We have tried to show how the nurse can spread the gospel of prenatal care, how she can practice the simple

principles of obstetric cleanliness in the hovel as well as the hospital, how she can early detect the signs of impending eclampsia, and how she can aid in averting the dangers of complicated labor. The rôle of the modern obstetric nurse as a public health teacher has been stressed at appropriate places.

In view of the development of the science and of the general modern trend of the practice of psychology in its adaptations to medicine, the sections devoted to the mind of the pregnant, the parturient, and the puerperal woman have been enlarged, and, as bearing on the same subject, the psychologic and human relations of the nurse to her patient have been quite fully elucidated.

The chapter on Cesarean Section has been changed very little since this increasingly important operation was adequately presented in the last edition, but the subdivision on the destructive operations has been abbreviated, as these procedures are becoming almost obsolete in practice. Unfortunately their consideration cannot be omitted.

Pursuant of the expressed desires of several obstetric instructresses the methods of the Chicago Lying-in Hospital have been given more space, but not to the exclusion of the practices of other maternities of high standing. Indeed, the technic of the Chicago Lying-in Hospital has been enriched by the contributions of nurses who were trained in many hospitals, including the Sloane and Manhattan Maternities and the Lying-in Hospital of the city of New York, the Cook County, St. Luke's, Presbyterian, and Michael Reese Hospitals of Chicago.

Throughout the book we have never lost sight of the fact that the majority of births still occur in the home and that the nurses should be instructed how to care for them there.

A large part of the text has been rewritten and the rest given a most thorough revision. The author is cognizant of the higher medical plane upon which the modern nurse

stands, and he has therefore presented more of the scientific aspects of the obstetric art, but he has avoided as far as possible drawing her into controversial matters and has tried to keep the volume within the possibilities of the already crowded curriculum. He has set forth the principles underlying the treatment of the obstetric case and the reasons for the variety of procedures so as to enable the nurse to comprehend the objects sought and thus be a better co-operator for the welfare of the patient.

The reader will observe that in every chapter of the book a consistent effort has been made to raise the practice of obstetrics to a level even higher than that of surgery.

While working on the present revision the author was benefited by the advice of S. Lillian Clayton, R. N., of the Philadelphia General Hospital, Katherine DeWitt, R. N., (who contributed a chapter to the first edition in 1904), Mary C. Wheeler, R. N., of the Illinois Training School for Nurses, in connection with the Cook County Hospital, M. Helena McMillan of the Presbyterian Hospital, Jessie F. Christie, R. N., Wilhelmine Robinson, R. N., and Mabel C. Carmon, R. N. of the Chicago Lying-in Hospital, to all of whom he expresses his grateful appreciation.

To the Publishers, too, the author is grateful for the privilege of enlarging the volume and adding so many new illustrations.

JOSEPH B. DELEE.

CONTENTS

	PAGE
INTRODUCTION.....	17

PART I

Anatomy and Physiology of the Reproductive System

CHAPTER I

ANATOMY OF THE FEMALE GENERATIVE ORGANS.....	25
--	----

The Bony Pelvis, 25—Varieties of Pelvis, 30—The Soft Parts, 32—The Uterus, 32—The Bladder, 35—The Rectum, 36—The Peritoneum, 36—The External Genitals, 36—The Vulva, 36—The Perineum, 38—The Anus, 38—The Breasts, 39.

CHAPTER II

PHYSIOLOGY.....	41
-----------------	----

The Function of Reproduction, 41—Ovulation, 41—Puberty, 42—Menstruation, 44—Conception, 48—The Physiology of the Fetus in the Uterus, 58—The Placenta, 59.

CHAPTER III

PREGNANCY, LABOR, AND THE PUERPERIUM.....	62
---	----

Maternal Changes in Pregnancy, 62—Local Changes, 62—General Changes, 64—Labor, 68—Lightening, 69—False Pains, 70—The Show, 70—Stages of Labor, 70—The Labor-pains, 72—The Bag of Waters, 73—The Puerperium, 77—Involution, 77—The Lochia, 79—The Breasts, 81—General Changes in the Puerperium, 82—The Kidneys, 83—The Bowels, 83—The Skin, 83—The Mental Condition, 83.

CHAPTER IV

THE NEWBORN INFANT.....	85
-------------------------	----

The Baby in the First Weeks, 85—The Cry of a Newborn Infant, 86—Sleep, 86—Temperature, 86—The Skin, 87—The Navel, 87—The Baby's Bowels, 87—The Kidneys, 88—The Weight, 89.

CHAPTER V

THE HYGIENE OF PREGNANCY.....	PAGE 90
-------------------------------	------------

Mode of Living for the Pregnant Woman, 91—Dress, 91—Preservation of the Figure, 94—The Diet, 95—Exercise, 100—The Mind During Pregnancy, 101—Maternal Impressions, 103—The Determination of Sex, 104—The Bowels, 105—The Kidneys, 107—Toxemia, 107—Bathing, 108—Care of the Genitals, 108—Care of the Breasts, 110—The Engagement of the Nurse, 110—Prenatal Care, 111—The First Visit, 113—Diagnosis of Pregnancy, 114—Aschheim-Zondek Test, 115—Diagnosis of Time of Confinement, 115—Pelvic Measurements, 116—Taking the Blood-pressure, 116—Wassermann Test for Syphilis, 118—Urinalysis, 119—The Applied Hygiene of Pregnancy, 119—On Guard, 120—Preparation for Labor, at Home, 120—Instructions for the Obstetric Nurse, 123—Sterilizing, 123—The Routine Prenatal Visit, 126—Organized Prenatal Care, 128.

CHAPTER VI

THE INFANT'S LAYETTE.....	130
---------------------------	-----

The Wardrobe, 130—Nursery Conveniences, 132.

PART II

Nursing During Labor and in the Puerperium

CHAPTER I

CARE DURING LABOR.....	135
------------------------	-----

Care During the First Stage, 136—Preparation of the Room, 138—The Preparation of the Bed, 140—Preparation of Patient, 142—Preparation for the Doctor, 147—Preparation for Rectal Examination, 149—Preparation for Vaginal Examination, 149—The Diet in the First Stage, 152—Bowels and Bladder, 152—The History Sheet, 153—Preserving Asepsis, 153—General Instructions, 155—When to Summon the Doctor, 157—Care During the Second Stage, 160—General Instructions, 162—Severing the Cord, 169—Care During the Third Stage, 171—Perineorrhaphy, 175—The First Care of the Newborn Child, 178—The Prevention of Blindness, 179—General Care, 179—The Chicago Lying-in Hospital Method of Identification, 182—Technic in the Specialized Maternity, 183—Care After the Third Stage, 186—Anesthesia in Labor, 187—Ether, 189—Chloroform, 190—Nitrous Oxid and Oxygen Anesthesia, 191—Ethylene, 192—Gwathmey's Synergistic Analgesia, 193—Newer Analgesics, 196—Scopolamin-morphin Analgesia, 197—Local Anesthesia, 198.

CHAPTER II

	PAGE
CARE DURING THE PUERPERIUM.....	199
<p>Immediate Care of the Puerpera, 199—Daily Care of the Mother, 201—The Breasts, 201—Care of the Genitals, 204—Special Care in Cases of Complete Laceration of the Perineum, 205—The History Sheet, 207—The Diet, 207—The Bowels, 209—The Bladder, 211—Catheterization, 212—Sleep, 213—General Treatment, 213—The Treatment of the Mind, 217—The Time of Getting Up, 219—The Binder, 221—Nursing After the Patient is Up, 221.</p>	

CHAPTER III

CARE OF THE CHILD.....	223
<p>Visitors, 223—Bathing, 224—Preventing Epidemics, 228—Care of the Navel, 228—The Eyes, 229—The Bowels, 230—The Diaper, 233—Urination, 233—Nursing, 234—Expressing Milk from the Right Breast of Mother, 236—The Diet, 238—Weighing the Infant, 240—The Temperature, Pulse, and Respiration, 241—Fresh Air, 241—Training the Baby, 243—Home from the Hospital, 243.</p>	

CHAPTER IV

PRESENTATIONS AND POSITIONS.....	245
<p>The Diagnosis of Presentation and Position, 250—The Engagement of the Presenting Part, 254—Breech Cases, 254—Shoulder or Transverse Presentation, 256—Multiple Pregnancy, 256.</p>	

CHAPTER V

OBSTETRIC OPERATIONS.....	258
<p>Preparation for Operation, 259—Preparation of the Room, 262—Preparation for Complications, 264—Preparation of the Patient, 265—Preparation of Instruments, 268—Light and Heat, 268—Anesthesia, 269—Care After Operations, 269—Care of the Child, 270—Care of the Mother, 271—Major Operations, 271—The Forceps, 271—Duties of Nurse During Forceps Operation, 280—The Walcher Position, 280—Breech Extraction, 281—Version, 282—Destructive Operations, 283—Decapitation, 284—Craniotomy, 285—Preparation for the Mutilating Operations, 285—Baptism, 285—Cesarean Section, 286—Preparation for Cesarean Section, 288—Preparation for Emergency in the Home, 288—Light, Heat, and Anesthetic, 292—The Operation, 292—The Newer Cesarean Sections, 294—The After-care, 296—Convalescence, 300—Vaginal Cesarean Section, 301—Symphysiotomy, 302—Pubiotomy or Hebosteotomy, 302—The Operation, 302—After-care of Symphysiotomy and Pubiotomy, 303—Minor Operations, 301—Preparation for Obstetric Examination, 306—Perineorrhaphy, 307—Removal of Sutures, 308—Uterine Tamponade, 308—The Douche, 311—The Vaginal Douche, 311—The Uterine Douche, 312—Uterine Curetage, 312—</p>	

The Administration of Saline Solution, 313—Preparation for Blood Transfusion, 318—Venesection, 319—The Induction of Premature Labor, 321—Therapeutic Abortion, 326—Dührssen's Incisions, 327.

PART III

The Pathology of Pregnancy, Labor, and the Puerperium

CHAPTER I

OBSTETRIC COMPLICATIONS..... 329

Disorders of Pregnancy, 329—Minor Disturbances of Pregnancy, 330—Nausea and Vomiting, 330—Edema of the Extremities, 330—Varicose Veins, 330—Leukorrhea, 332—Pruritus Vulvae, 333—Pendulous Abdomen, 334—Pains in the Abdomen, 334—Heartburn, 335—Teeth, 335—Frequent Urination, 335—Fainting, 336—Backache, 336—The Grave Disturbances of Pregnancy, 337—The Toxemia of Pregnancy, 337—Hyperemesis Gravidarum, 338—Prevention of Decubitus, 344—Pre-eclamptic Toxemia, 344—Eclampsia, 345—Treatment, 346—Chronic Nephritis, 356—Hemorrhages During Pregnancy, 357—Abortion, 357—Premature Labor, 358—Placenta Praevia, 359—Premature Detachment of Placenta, 362—Extra-uterine Pregnancy, 363—Symptoms, 366—Duties of the Nurse, 366.

CHAPTER II

COMPLICATIONS DURING LABOR..... 368

Delivery before Doctor's Arrival, 368—Breech Presentation, 375—Prolapse of the Cord, 375—Acute Delirious Mania, 378—Hemorrhage During Labor, 379—Rupture of the Uterus, 379—Postpartum Hemorrhage, 380—After-care, 385.

CHAPTER III

COMPLICATIONS OF THE PUERPERIUM..... 387

Puerperal Infection, 387—Frequency and Source, 390—The Prevention of Puerperal Infection, 392—The Asepsis of the Nurse, 393—Symptoms, 394—Treatment of Puerperal Infection, 395—Nourishment, 397—Rectal Infusion, 399—Medical Treatment, 399—Mental Treatment, 401—Surgical Treatment, 401—The Child, 403—The Nurse, 403—History Sheet, 405—Limitation of the Infection, 405—Puerperal Thrombosis, 407—Embolism, 407—Phlegmasia Alba Dolens, 407—After-pains, 408—Tympany, 409—Constipation, 410—Vesicovaginal Fistula, 411—Cystitis, 413—Method of Collecting Sterile Urine, Catheterization, 414—The Two-basin Method, 414—Headache, 414—Subinvolution, 415—Diseases of the Mind, 415—Nervous Breakdown, 415—Puerperal Insanity, 416—Treatment, 416.

CHAPTER IV

PAGE

COMPLICATIONS OF THE PUERPERIUM (*Continued*)

Diseases of the Breast, 418—Simple Engorgement, 419—Treatment, 420—Abnormalities of the Nipples, 423—Cracks, Fissures, and Blisters of the Nipple, 425—Mastitis, 429—Treatment, 431—Galactorrhea, or Excess of Milk, 435—Agalactia, or Scarcity of Milk, 436—Treatment, 437—Abnormal Milk, 440—Drying Up the Milk, 441—Care of a Wet-nurse, 441.

CHAPTER V

THE DISORDERS OF THE FIRST WEEKS OF LIFE..... 443

Affections of the Digestive Organs, 443—Indigestion, 443—Colic, 444—Difficulty in Nursing, 444—Vomiting, 445—Constipation, 445—Diarrhea, 446—Green Stools, 447—Melena Neonatorum, 447—Inanition Fever, 447—Thrush or Sprue, 448—Bednar's Aphthae, 448—Sore Buttocks, 449—Marasmus, 450—Affections of the Respiratory Tract, 451—Snuffles, 451—Coryza, 451—Bronchitis and Pneumonia, 451—Cyanosis or Blue Babies, 452—Atelectasis, 452—Affections of the Urinary Organs, 453—Delayed Urination, 453—Uric Acid, 454—Phimosis, 454—Circumcision, 454—Dilatation, 457—Affections of the Skin, 458—Jaundice, 458—Eruptions on the Skin, 458—Vesicular Eruptions, 459—Chafing, or Eczema Intertrigo, 460—Treatment, 460—Pemphigus, 460—Other Affections of the Newborn Infant, 462—Enlargement of the Breasts, 462—Vulvitis, 462—Menstruation, 462—Delayed Separation of the Cord, 463—Granulations of the Navel, 463—Infections of the Newborn, 463—Infection of the Umbilicus, 464—Infection of the Eyes, or Ophthalmia Neonatorum, 465—Prevention, 466—Treatment, 467—Care of the Nurse Herself, 469—Infection of the Mouth and Throat, 469—Pyelitis, 470—Hemorrhages in the Newborn, 470—Operative Injuries, 470—Injuries to the Brain, 473—Caput Succedaneum, 474—Cephalhematoma, 474—Congenital Deformities, 475—Monstrosities, 475—Harelip or Cleft Palate, 475—Occlusion of the Anus or Imperforate Anus, 475—Tongue-tie, 476—Hernia, 476—Sundry Complications, 477—Convulsions, 477—Lockjaw or Tetanus, 477—Complications Due to the Use of Hot-water Bags, 479—Overlying the Child, 479—Asphyxia Neonatorum, 479—Treatment, 480.

CHAPTER VI

THE CARE OF PREMATURE INFANTS..... 485

The Incubator or Couveuse, 488—Care of the Incubator, 493—The Ventilation, 494—The Bed, 495—General Care, 495—The Dress, 496—Warm Feet, 497—The Diet, 498—Method of Feeding, 501—The Bath, 504—The Care of the Eyes, Nose, Mouth, etc., 505—General Care, 506—Removal from the Incubator, 506—The Particular Diseases of Premature Infants, 507—Thrush or Sprue, 508—Nasal Infection, 508—Cyanosis, 509—Atelectasis Pulmonum, 510—Convulsions, 510.

CHAPTER VII		PAGE
INFANT FEEDING.....		512
Introduction, 512—Milk as a Food, 512—Proteins, 513—Fats, 513—Carbohydrate, 514—Salts, 514—Water, 514—Vitamins, 514—Breast Milk Ideal Food for Infants, 515—Contraindications to Maternal Nursing, 515—Activity of the Breast, 516—Quantity of Milk in a Breast, 517—The Size of Feeding at the Breast, 517—Factors Which Influence Breast Milk, 517—Nursing Technic, 518—Duration and Intervals of Feeding, 519—Complementary and Supplementary Feeding, 520—Overfeeding at the Breast, 520—Underfeeding at the Breast, 520—Chemical Examination of Breast Milk, 521—Artificial Feeding, 521—Differences in Composition of Human and Cow's Milk, 522—Theoretical Basis for Modification of Cow's Milk, 523—Rules for Formula Writing, 524—Preparation of the Formula, 526—The Nursing Bottle and Nipple, 527—Technic of Feeding, 527—Additions to Infant's Diet, 528—Certified Milk, 529—Pasteurized Milk, 530—Buttermilk, 530—Whole Lactic Acid Milk, 531—Protein Milk, 531—Evaporated Milk, 531—Condensed Milk, 532—Dried Milks, 532—S. M. A., 532—Milk Foods, 532—Liebig or Malted Foods, 532—Farinaceous Foods, 532—Goat's Milk, 533—Barley, Rice, Wheat, or Oatmeal Water, etc., 533—Cereals, 534—Vegetable Soup, 534—Vitamins, 535—Growth and Development, 535.		

APPENDIX

VISITING NURSING IN OBSTETRIC PRACTICE.....	537
Care During Labor Among the Destitute, 537—Duties During the Puerperium, 540	
HOSPITAL <i>vs.</i> HOME NURSING.....	544
Ward Care, 544—In the Nursery, 545—Recording of Symptoms, 546—Prevention of Accidents, 546—Orders, 547—Relations to the Patient, 548—Economy, 548.	
PELVIC MENSURATION.....	549
METHODS OF STERILIZATION.....	557
Sterilization of the Hands, 558—Fürbringer's Method, 558—Hot Water and Alcohol Method of Ahlfeld, 559—Usual Method, 559—Rubber Gloves, 559—Sterilizers, 561—Sterilization by Dry Heat, 562—Preparation of Instruments, 563—Sterilization of Brushes, 564—Preparation of Dressings, 564—Turkish Pads, 566—Newspapers, 566—Lysol Gauze for Tamponade, 566—Plain Sterilized Gauze, 567—Iodoform Gauze, 568—Gelatin Gauze, 570—The Kite-tail Tampon, 570—Suture Material, 570—Catgut, 570—Silk, 572—Waxed Silk, 572—Linen Suture Yarn, 573—Linen Bobbin for Tying the Cord, 573—Basins, Pitchers, Douche-cans, Bed-pans, 573—Gowns, Aprons, Leggings, Towels, Sheets, Pillow-slips, 574—Tables, Chairs, Bed, Furniture, 574—Mattresses, 574—	

Sterilizing Apartments, 575—Preparation of Solutions, 576—Sterile Water, 576—Bichlorid of Mercury Solutions, 577—Acriflavin Compound, 577—Carbolic Acid Solution, 577—Lysol Solution, 578—Formalin Solution, 578—Creolin, 578—Salt Solution, 578—Boric Acid Solution, 579—T. G. C. Jelly, 579.

CONTENTS OF DRUMS AT THE CHICAGO LYING-IN HOSPITAL..... 579

Labor Drum, 580—Gown Drum, 581—Laparotomy Drum No. 1, 581—Laparotomy Drum No. 2, 582—Vaginal Drum, 582.

THE OBSTETRIC NURSE..... 583

Articles Needed by, 583—The Nurse's Dress, 585—Department, 585—Venereal Diseases, 586—Gonorrhea, 587—Syphilis or "Specific Disease," 588—General Consideration of Venereal Disease, 590.

DIETARY..... 590

List of Diets, 590—Absolute Milk Diet, 590—Liquid Diet, 590—Semisolid Diet, 591—Special Perineorrhaphy Diet, 591—Non-protein Diet, 591—Pre-eclamptic Diet, 591—Diet for the Prevention of Overgrowth of the Child, 591—Recipes, 591—Albumen- or Egg-water, 591—Barley-water, 591—Beef-tea, 592—Beef-juice, 592—Beef-tea with Acid, 592—Cereal Extract, 592—Chicken Broth, 592—Clam Broth, 592—Champagne Whey, 592—Egg Lemonade, 592—Eggnog, 592—Flaxseed Tea, 593—Flour-ball, 593—Gum-arabic Water, 593—Junket, 593—Koumiss, 593—Meat Cure, 593—Meat Diet, Raw, 593—Meat-extract Ice, 593—Milk and Egg, 594—Milk Digested with Acid, 594—Milk, Peptonized: Cold Process, 594—Warm Process, 594—Milk-toast, Peptonized, 594—Milk, Sterilized, 594—Milk-shake, 594—Mutton Broth, 594—Nutritious Coffee, 594—Rice-water, 595—Rum Punch, 595—Toast-water, 595—Vitamins, 595—Whey, 595—Wine Whey, 595—Rectal Feeding, 595—Feeding Through the Skin, 596—Soda Solution, 597—Duodenal Feeding, 597—Nasal Feeding, 599—Continuous Intravenous Treatment, 600—Avoirdupois-Metric Chart for Babies, 601.

GLOSSARY..... 603

AN OUTLINE FOR STUDY..... *Follows* 634

INDEX..... 635

OBSTETRICS FOR NURSES

INTRODUCTION

STATISTICS show that of every 200 women who become pregnant, at least 1 dies. Seven per cent of the deaths of women between the ages of twenty and forty years are due to puerperal infection. Conservatively estimated, 23,000 women die every year in the United States from the immediate and remote effects of childbirth. Tuberculosis is first, childbirth is second in the number of deaths in women from fifteen to forty years of age! One hundred thousand babies die every year in the United States *during delivery*, and another hundred thousand die in the first four weeks thereafter. This is three times as many men's lives as we lost in the War, and these mothers' and babies' deaths were from causes largely due to the process of childbirth itself, and largely preventable—childbed fever and convulsions and birth injuries and infections.

Thousands of women enter our hospitals each year for the repair of injuries acquired during delivery, and seeking relief from the diseases caused by child-bearing.

Nearly one-third of the blind people in this world have lost the light of day because of the ignorance or the carelessness of the attendants at the time of birth.

What are the causes of these evils? The standard of obstetric practice is low. The people are allowed to believe that labor is a natural process and requires no special care. Therefore men with the best minds, with the greatest skill, find their endeavors better rewarded in other fields of medical practice.

The public is only just beginning to recognize, with appreciation and remuneration, the strenuous labors of the accoucheur, the nights' rest lost, the interference with his other practice, the nervous wear and tear, and the actual technical skill he exhibits. Small wonder then that the field is deserted save by those who do the work to maintain a family clientèle.

Why should not the woman about to perform the highest function of the race, at the most interesting, most endearing, and the crucial moment of her life, enjoy the greatest benefits, the finest art that the science of medicine affords?

She should and she must, and the nurse has a great opportunity, as well as a privilege and a duty, in helping to bring about such a happy state.

By the power of good example and by precept she will instil in the public mind a knowledge of the importance of obstetrics and will engender a respect for the art which will soon result in a demand for higher standards of practice, and this demand will draw to the specialty the best medical and nursing talent the community possesses. She becomes really a missionary spreading the gospel of good obstetrics.

Specifically, what may the nurse do to help to reduce the number of maternal deaths in childbirth, to diminish the amount of invalidism of the mothers, to prevent blindness, to save the babies, and to provide them with healthy, vigorous bodies at the start of their earthly careers? She may do much, and this is brought out in the text of the book. Here we may emphasize only a few general principles.

1. The nurse has peculiarly favorable possibilities as a *health teacher*. She lives in the home, can observe how the laws of health are being observed or neglected, and her close association with the family enables her to correct evil habits of living and instill good ones. This is of course true of general hygiene, but is especially true in the case of the expectant mother. The nurse explains and teaches the benefits to be derived from fresh air,

proper food, pure water, regular bathing, exercise, etc., and she must be so insistent and convincing that the woman is converted to good habits for life.

2. The nurse urges upon all women the importance of consulting a competent accoucheur early in pregnancy, and placing themselves at once in his hands for prenatal care, so that complications may be discovered early and averted. The important part the nurse has to take in the prenatal care of her patient is fully described in the text.

3. The nurse may aid the physician in obtaining aseptic conditions during the labor. She should prepare for a confinement just as she would prepare for a vaginal hysterectomy. She will meet opposition in this endeavor, especially from the older members of the family, but quiet insistence will be successful. She may explain to the patient that all the preparations are not because trouble is expected, but for the purpose of preventing trouble, and that accidents are more likely to occur if such preparations are not made.

The nurse may allay the alarm of the parturient and the family when the accoucheur asks for sufficient medical assistance. Most deliveries are accomplished by the physician alone, with the nurse and such help as the husband and a courageous neighbor may give. The accoucheur often has to work over a low bed, and in a small room with insufficient light. The people, from long custom, regard this proceeding as good. It is bad. This make-shift method is unjust—unjust to the parturient, to the unborn child, and to the doctor and the nurse. No general surgeon tolerates such conditions.

Compare the advantages of the surgeon in his capacious operating-room, with good light, sterile utensils, many nurses and assistants, with the plight of the obstetrician. Compare also the conditions in which the hospital nurse works and those to which the nurse in home practice must adapt herself. Thus it is not far to go to explain the existence of the evils referred to in the opening paragraphs.

All women cannot go to maternities, a large proportion is still confined at home. Therefore, the nurse must learn how to imitate hospital conditions in the home, how to utilize such utensils and materials she finds at hand, and how to carry out the principles of obstetric asepsis in the hovels of the city, the farmer's cottage miles from town, as well as in the perfectly appointed homes of the rich. While the author has attempted thus to prepare the nurse by means of this book, it would be better if her training could comprise a course in the out-patient department of some maternity hospital. Such an experience will be all the more valuable to the nurse since, besides giving her actual practice, it will develop her character spiritually. She will get a glimpse into how the other half—the lower half—lives, and this will surely unfold in her breast the spirit of social service. The term "Social Service" is generally used in reference to work among the very poor, but I know that the spirit of service is needed by mothers in all walks of life, and one of the grateful duties of the nurse is to make each of her patients, high or low, rich or poor, feel that, under her starched professionalism there beats a deeply sympathetic heart and an earnest desire to help.

4. Last to be mentioned but first in importance is the obstetric or surgical cleanliness of the nurse herself. Without question the greatest single boon the nurse can confer on the mother and baby is the practice of asepsis. To be sure, her assistance to the doctor in his technic is necessary and valuable, but in her own ministrations to the patient—the treatment of the genitalia, of the breasts, the care of the baby's navel, eyes, mouth, skin, etc.—in all these peculiarly nursing duties, if she is absolutely clean—*i. e.* aseptic—she will do more to reduce the grievous maternal and infantile mortalities than in the performance of any of her other professional functions.

The author is well aware of the arduous nature and multiplicity of the duties of the obstetric nurse, and he

knows the difficulties she overcomes in carrying out the principles of asepsis, even in a well-appointed hospital. He takes this opportunity to applaud her success. But he has greater admiration for her courage to conquer monotony. The ability to do the same thing day by day, and many times each day, year in and year out, and to do it well each time—this is the soul of the true artist. It is said that a spectator of any two of the perfect performances of Sarah Bernhardt in the same play could not detect the slightest difference. A violinist having attained perfection in a given piece, plays it every time with identical values of spirit and form. In the same way the nurse (and the surgeon too) must carry out on each successive patient with unvarying and unfailing fidelity, the innumerable minutiae of obstetric asepsis. It requires great steadfastness of character.

To sum up: In her rôle as health teacher, in her devotion to the child-bearing woman and the newborn baby, and in her social service, the nurse will find a large sphere of usefulness, and her efforts will redound to her own spiritual uplift, to the benefit of the medical profession of which she is a part, and, lastly and mostly, to the good of the community.

Only in this way, that is, by better obstetrics, may we hope to see the frightful mortality tables shrink, and our hospitals emptied of women seeking relief from the injuries and diseases caused by pregnancy and labor.

In this book the subject is divided into three parts. In the first part the anatomy and physiology of the whole reproductive cycle are considered—that is, a description is given of the various processes, the changes in the genitals and general system, occurring during normal pregnancy, labor, and the puerperium. The nurse views the normal function like three consecutive acts in an interesting play.

The second part deals with the conduct or management of pregnancy, labor, and the puerperium. The nurse is

told how to care for a woman during each of these periods of the normal reproductive cycle.

The third part treats of the pathology of pregnancy, labor, and the puerperium. In this part are considered, from the nurse's standpoint, the complications which may disturb the normal course of the three stages of reproduction, and how the nurse may do her share of the work of saving both patients from their baneful effects.

In addition, there follow a few chapters on allied subjects, such as visiting nursing, pelvic measurement, hospital and home nursing, and an outline for study.

By keeping these divisions of the subject in mind the nurse will find the study much simplified, and the book will be more easily grasped and rendered applicable to every-day practice.

It is not to be understood that the treatment recommended in this book is to take the place of the doctor's orders. The nurse should learn the practice of the physician with whom she works, and carry out this practice in his cases. The author hopes that the book will be of help to her when she is on her own responsibility and for her general information.

This edition of the book marks the forty-first anniversary of the author as a teacher of nurses and medical students. Throughout these years he has followed a system of pedagogy which this long experience has more than justified—that is, to give his pupils the fundamental principles underlying a subject and then treat one method of practice very thoroughly, with brief but adequate reference to other methods.

This plan is pursued because inexperience is not able to select from a mass of conflicting theories and modes of practice the safest and best for the patient. The event has not shown that the nurse will become biased and opinionated—her whole hospital training forbids this—but we have had plenty of opportunity to observe that

during the time she is acquiring in her actual work the necessary ability of selection, she has been grateful for the firm foundation on which her practice rests and her charges have been, at least, safe, and enjoying the benefits of an accepted technic.

Furthermore, most physicians, knowing the nurse to possess the ground principles and to be trained in approved methods, are happy to let her carry them out on their patients, adding or altering, of course, one or the other special detail as occasion demands.

Taking advantage of the Publishers' generous permission to enlarge the volume the author has incorporated in the text many extracts from his lectures to the nurses and from his addresses to graduating classes. These matters, all of which were already touched upon in previous editions, have to do with pointing out the beauties of the reproductive function and the miracle of birth; with increasing the nurse's interest in the art of obstetrics by historic references and quaint old woodcuts; with emphasizing the fascination of this branch of nursing and the spiritual satisfaction it gives the nurse; and with a portrayal of the relations of the nurse to her patient as an individual—a human being undergoing an ordeal which calls forth all the sympathy a woman possesses and stimulates a desire to be of service. This is the spirit of the dedication of the book with its quotation from Oliver Wendell Holmes.

PART I

ANATOMY AND PHYSIOLOGY OF THE REPRODUCTIVE SYSTEM

CHAPTER I

ANATOMY OF THE FEMALE GENERATIVE ORGANS

THE parts of the woman's person with which the obstetric nurse has particularly to do are the pelvis, including the soft parts, and the breasts.

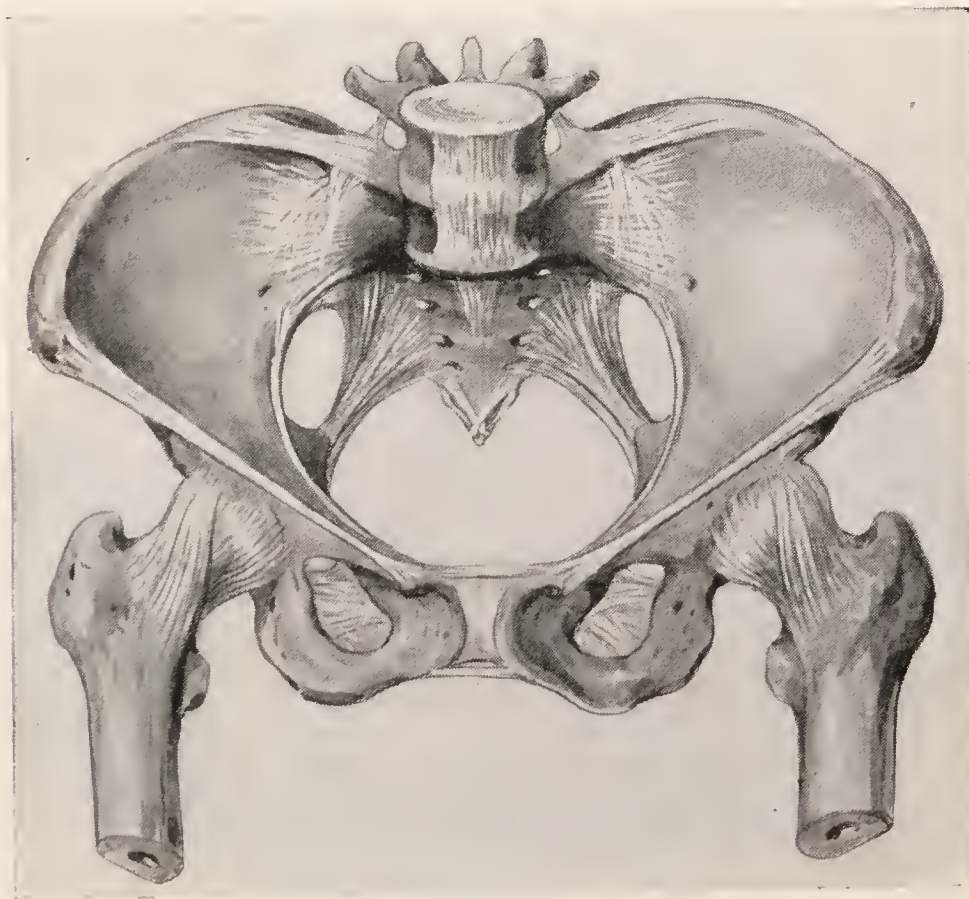


Fig. 1.—Normal female pelvis.

The **bony pelvis** (Figs. 1-3) is that part of the skeleton interposed between the trunk and the thighs. It consists

of four bones—two *ossa innominata*, the *sacrum*, and the *coccyx*. These are so united that they form two cavities—

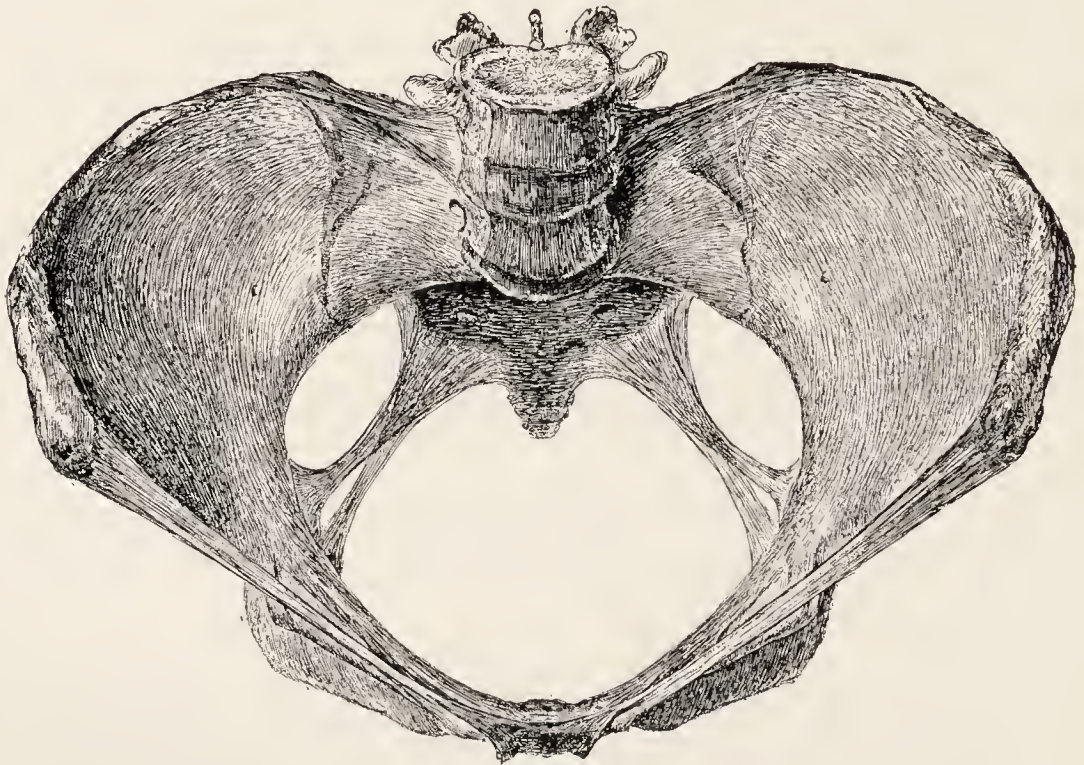


Fig. 2.—Female pelvis with ligaments, viewed from above (Dickinson).



Fig. 3.—Female pelvis with ligaments, viewed from below (Dickinson)

a greater or upper, or *false pelvis*, a smaller or lower, or *true pelvis*.

The *innominate bones* flare outward like wings, and leave a space in front which is filled out by the abdominal muscles, and behind, above the sacrum, the spinal column completes the false pelvis. The *false pelvis* is like a flat funnel, and

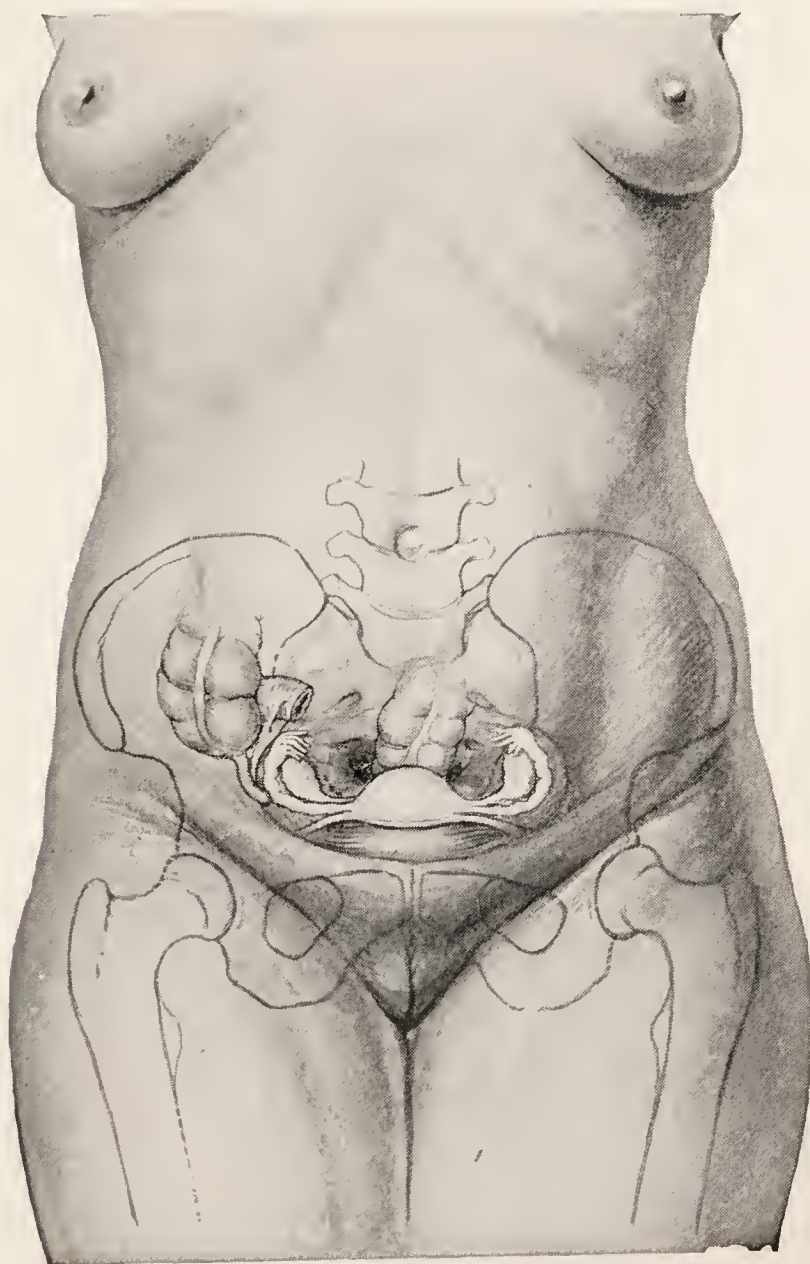


Fig. 4.—Female pelvis as seen through torso. Uterus, adnexa, rectum, cecum, and appendix are shown in their usual positions.

has the function of directing bodies in the abdomen into the true pelvis. The broad scoop-like *ossa innominata*, with the abdominal wall, support the abdominal contents.

The *true* or *small pelvis* is just below the large pelvis; behind, it is made up of the sacrum and the coccyx; at the

sides, by the innominate bones; and in front, by the rami of the innominate bones. In front it is only 2 inches high but behind it is 6 inches. The bony pelvis is exceedingly

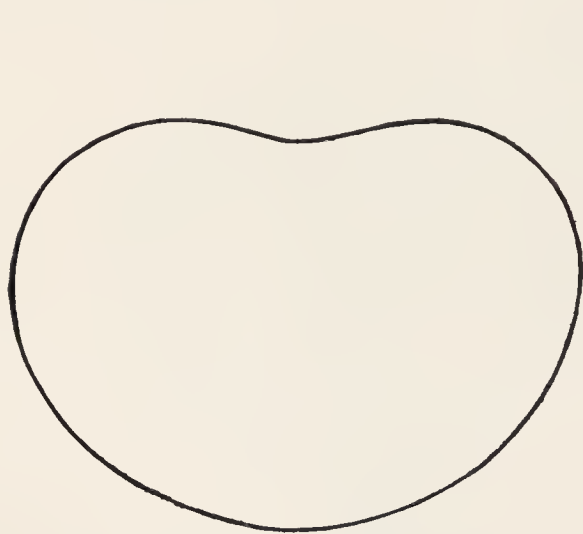


Fig. 5.—Outline of the pelvic inlet. Note transverse ellipse.



Fig. 6.—Outline of the pelvic outlet. Note anteroposterior ellipse.

irregular in outline, having many notches, and several openings through which various structures—muscles, nerves, blood-vessels, etc.—pass.

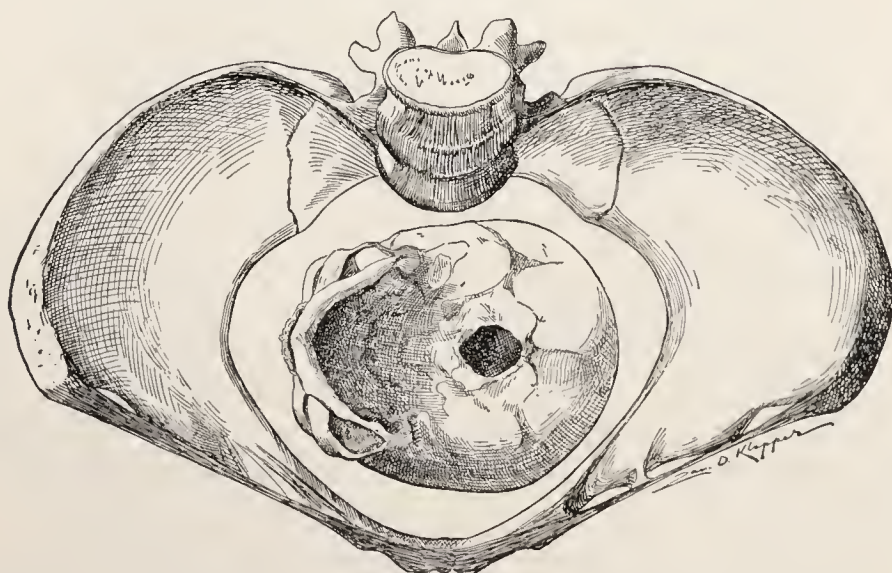


Fig. 7.—Head of fetus at the inlet of the pelvis. Long diameter of head lies transversely. Viewed from above.

In general, the shape of the cavity of the true pelvis is that of an elbow of stovepipe. Where the true and false pelves join there is a more or less marked rim. This place is called the *inlet*, *brim*, or *upper strait*, the pelvis being nar-

rower here (Figs. 2, 5). At the lower end of the true pelvis is the *outlet* (Figs. 3, 6). The inlet is shaped like a flattened heart; the outlet, an anteroposterior ellipse, so that an ovoid body like the baby's head, passing through the inlet in the transverse diameter, in order to escape from the outlet must turn its long diameter to correspond with the long diameter of the outlet (Figs. 7, 8). This occurs during labor and is called "rotation." Compare Fig. 36, p. 75.

Since the cavity of the pelvis is curved—a bent canal—the head must slide along it, taking a curved course; and

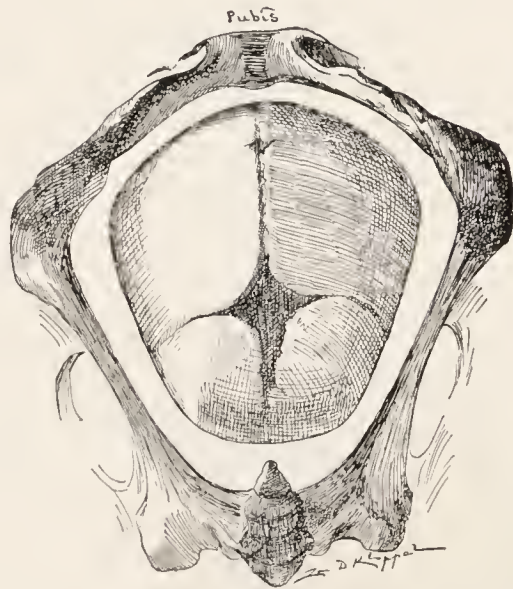


Fig. 8.—Head of fetus at the outlet of the pelvis. Long diameter of head lies anteroposteriorly, ready to escape from pelvis. Viewed from below.

since the anterior part of the curve is shorter than the posterior, the part of the head lying behind will have to travel a greater distance than the part lying in front. These are the things which the doctor must consider when he studies the mechanism of labor.

The pelvis is set into the body in such a way that when the woman is standing, not all the weight of the abdominal viscera is forced down into its cavity; part is borne by the abdominal wall and pubis. When a woman constricts the abdomen in any way, as by a corset or a girdle, the viscera are forced downward, and since the false pelvis is a funnel

leading into the true pelvis, the organs here are pressed down, and this may bring about prolapse of the uterus, bladder, etc.

The *pubes* or *symphysis pubis* is the anterior junction of the two innominate bones. It is covered by a thick pad of fat, the *mons veneris*, and is strongly hirsute in most women. The pelves of two women are never exactly alike. Not one pelvis in 20,000 is exactly symmetric. There are characteristics in pelves as regards race, age, environment, occupation, and disease.

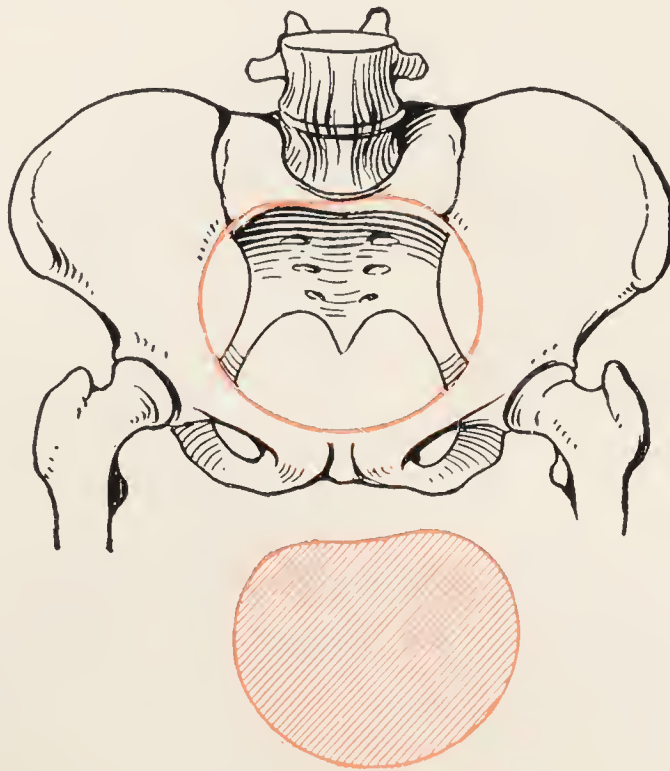


Fig. 9.—Normal pelvis. Inlet is outlined in red and shown below.

Varieties of Pelves.—In general, there are four varieties of pelves—large, small, flattened, and distorted. Finally,

The causes of contracted and deformed pelves may interest the nurse, as she may guide the mother in rearing her children so as to avoid them. Rickets and other nutritional diseases, lack of vitamins, endocrinal disturbances and those factors which favor imperfect development of the body may be so treated that the pelvis will develop normally. A nurse may warn the mother that hip disease, infantile paralysis, etc., may cause a deformed pelvis, and thus induce her to consult her physician.

there are all sorts of combinations of these. A description of the various forms of pelvis would fill several volumes, and cannot be given here, but pictures of a few of the most marked deformities are presented (Figs. 10-13).

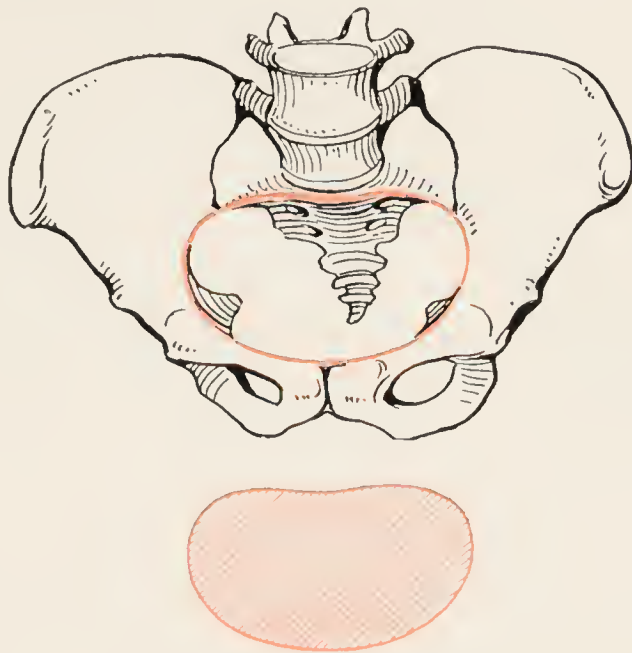


Fig. 10.—Flat pelvis.

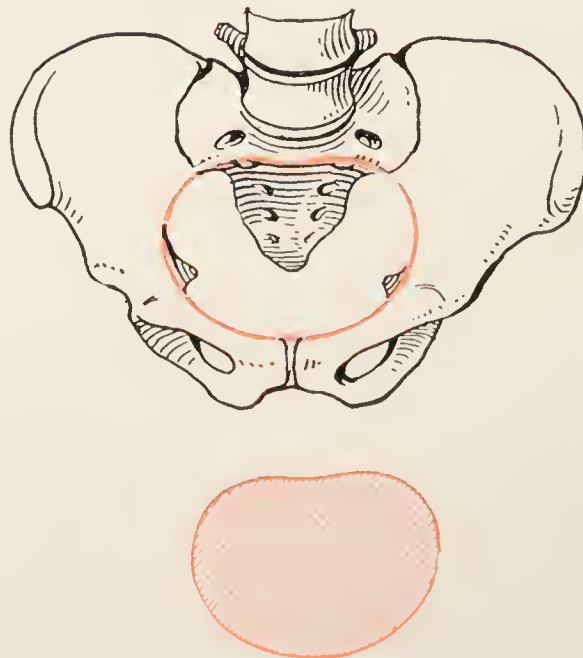


Fig. 11.—Generally contracted (justo-minor) pelvis.

The importance of deformed pelvises is great. If a pelvis is too large, the child may be forced through too quickly and tear the soft parts, or may come in anomalous positions. If the pelvis is too small, the mechanical disproportion between the size of the pelvis and of the baby may

make the delivery of the latter impossible, or so difficult as to endanger its life or that of its mother. The same may be said of the other forms of contracted pelvis. Much depends on the kind of contraction and its degree, and the size of the baby is important too. A large woman seldom has a small pelvis; a very small woman seldom has a large pelvis.

The Soft Parts.—The pelvis is lined and covered with soft tissues, some of which act simply as fillers; others are

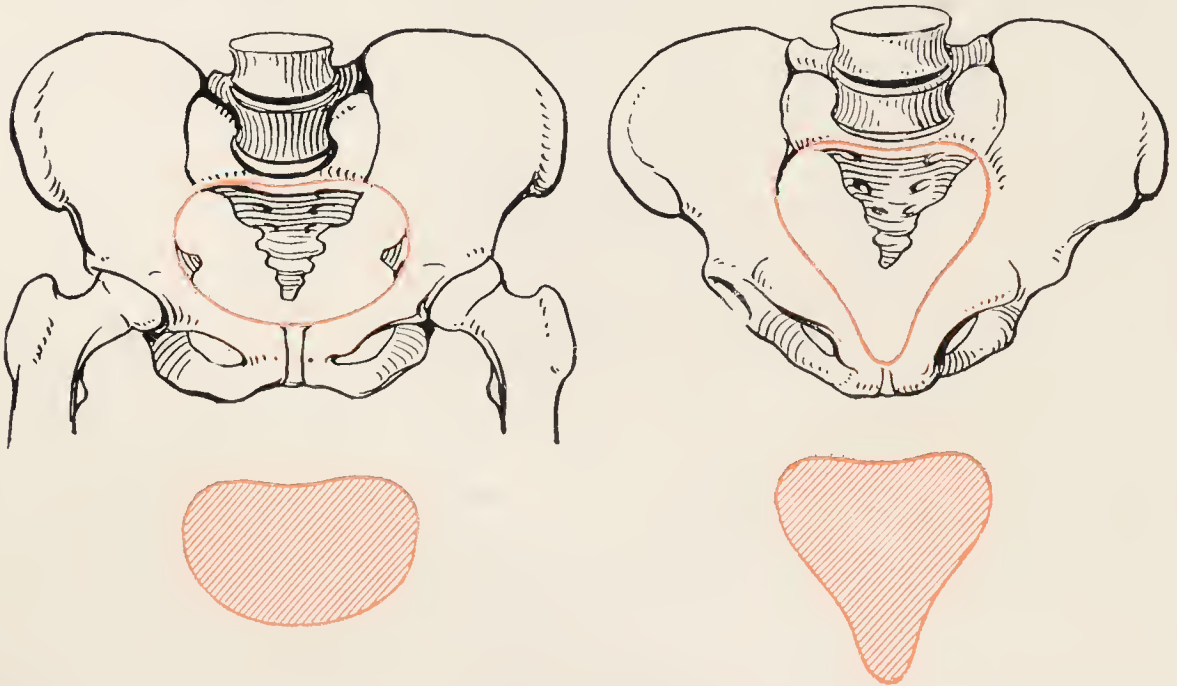


Fig. 12.—Generally contracted and flat pelvis.

Fig. 13.—Osteomalacic pelvis.

Figs. 10-13.—The inlet in each case is outlined in red and shown below. All were drawn to same scale.

muscles for various working functions. Then there are special organs, as the bladder, uterus, vagina, rectum, and finally there are the blood-vessels and nerves.

The large pelvis is lined with muscles, and is completed in front by the abdominal muscles. These serve to increase the funnel shape and to support somewhat the abdominal contents. The small pelvis has few muscles, but many important organs, vessels, nerves, etc.

The Uterus.—This organ (Figs. 14, 15) occupies the middle of the pelvis, being suspended in the connective tissue and peritoneum from the walls of the pelvis. It is a

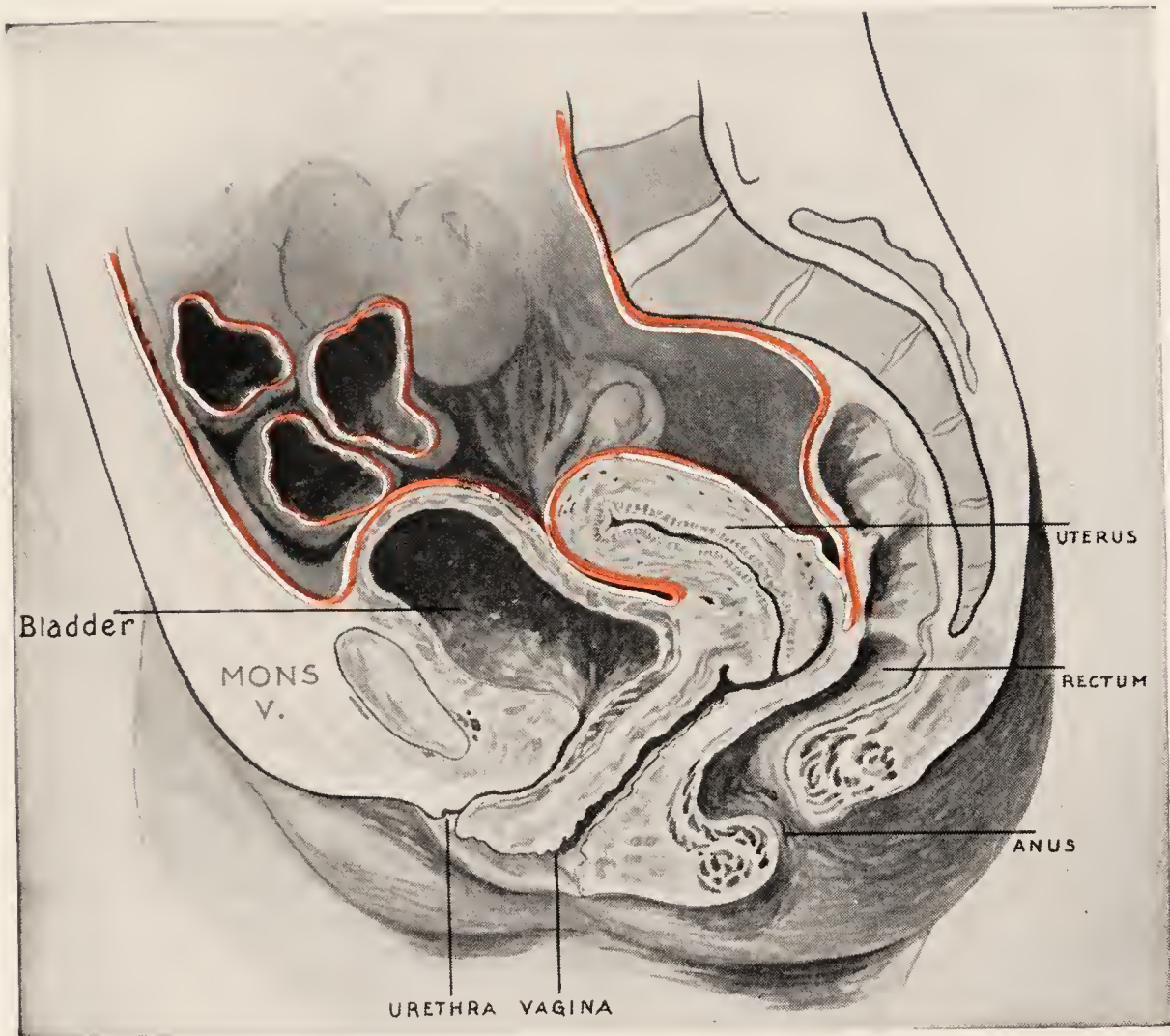


Fig. 14.—Section showing bladder, uterus, and rectum. Red line indicates cut edge of the peritoneum.

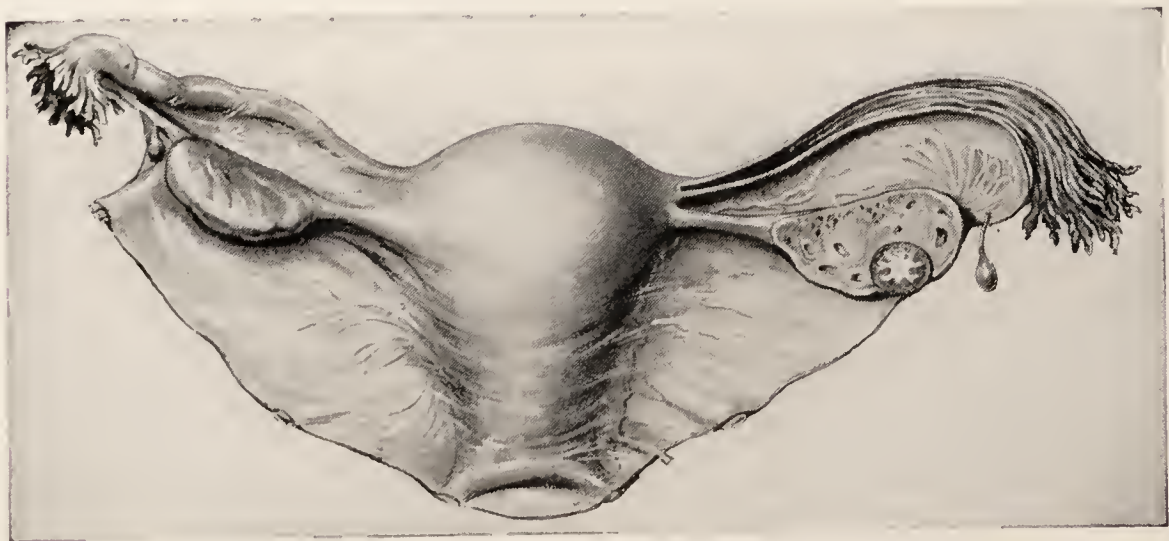


Fig. 15.—Uterus, tubes, and ovaries. On the right the ovary and tube have been laid open. Viewed from behind.

flattened, pear-shaped body, $2\frac{1}{2}$ inches long, $1\frac{1}{4}$ inches wide, $\frac{3}{4}$ inch thick, and weighs from 2 to $2\frac{1}{2}$ ounces. It is a firm organ, but when pregnant it grows very soft and increases enormously in size and capacity. It has two parts—the *fundus* and the *cervix*. The cavity of the uterus is usually closed by apposition of the walls; it is long, narrow, and flattened. The cervix has a little round opening called the *os*, through which the uterine secretions, the menstrual blood, during labor the ovum, and during the puerperium the lochial discharges, pass. In virgins it is a round opening; in women who have had children, a transverse slit.

The uterus is attached at the middle of the cervix to the *vagina*, a sheath 4 inches long, terminating at an opening in the skin called the *vulva*. The vagina is a very elastic tube and lies between the bladder and the rectum. In ordinary conditions it will admit one or two fingers, but during labor it stretches to 4 or 5 inches in diameter. The uterus has, leading outward from its upper corners, two tubes—the *fallopian tubes*. These are about the size of a crow's quill, are tortuous, growing larger as they leave the uterus, to terminate in trumpet-shaped ends fringed with delicate streamers called *fimbriae*. The canal of the tube likewise grows larger after it leaves the uterus. Thus there is a free passage through the vulva, the vagina, the *os*, the cervix, the uterine body, and the tubes to the fimbriated ends opening out into the peritoneal cavity.

The organs just named are composed of walls more or less thick, made up of muscle and connective tissue, lined throughout with mucous membrane, and covered by peritoneum for part of the distance. The mucous membrane varies in quality in different portions of the canal, according to the function required of the part: at the vulva it is delicate and very sensitive; in the vagina, rough and strong; in the cervix and uterus, very vascular and velvety. In the uterus and tubes the epithelium is covered with a microscopic down which has the function of automatic waving

like a field of wheat in the wind, thus propelling toward the outlet any object (in nature, the egg) lying on the surface.

All the organs in the pelvis, particularly the uterus and vagina, are richly supplied with blood-vessels. This is the reason that lacerations, produced during labor, bleed so freely, and sometimes fatally.

The nurse should also remember that there is a clear passage from the external world up through the uterus and tubes into the peritoneal cavity. Thus germs deposited in the vagina may wander upward and cause peritonitis and other forms of infection, this beside the possibility of the direct inoculation of bacteria into the tissues by way of wounds, all of which emphasizes the necessity of absolute cleanliness (asepsis) in the care of the pregnant, parturient, and puerperal woman.

The layers of peritoneum covering the anterior and posterior walls of the uterus meet at the sides of the organ and form flattened bands stretching to the side walls of the pelvis, containing vessels, nerves, and a little fat, and called the *broad ligaments*. These have great importance in obstetrics. Attached to the posterior side of each broad ligament, and connected with one of the fimbriae or streamers of the fallopian tube, is a little body, in shape and size like an almond, hard, fibrous, silvery white, and dimpled—this is the *ovary*. This tiny organ has many functions, each of tremendous influence on the growth and life of the woman, and it also produces the ova or eggs for the continuation of the race.

The Bladder.—This organ (Fig. 14) lies in front of the uterus, behind the pubis. From the bladder, lying along the side of the cervix, the *ureters* run up out of the pelvis to the kidneys. In front of the vagina, just behind and below the pubis, lies the *urethra*, a small tube about the size of a lead-pencil, leading from the bladder to open in the upper part of the vulva. The bladder empties itself through the urethra. The urethra ends in the vestibule

of the vulva, the opening being called the *meatus urinarius*. (See Fig. 16.)

The Rectum.—Behind the uterus, to the left side, lies the rectum (Fig. 14), or the last portion of the intestinal canal. It is continuous with the sigmoid flexure of the colon above, and terminates at the skin below in the *anus*. The rectum is a large, slightly convoluted tube, of much strength and great distensibility. Its course upward and to the left is noteworthy. A rectal tube in passing should take these directions.

The Peritoneum.—The pelvic peritoneum, a thin, glistening, veil-like structure, a part of the general abdominal peritoneum, comes down from above and covers the top of the bladder, the uterus, the tubes, and the rectum. Thus a woman who has an infection of the genital organs may develop general peritonitis by simple continuity of surface. (See red line in Fig. 14.)

The External Genitals.—The outlet of the bony pelvis is filled in by muscles and covered by skin. At the sides of the lower end of the trunk the thighs are inserted, and between the two thighs lies a space called the *genital crease* or fold. This area extends anteriorly to the pubis and posteriorly to the sacrum, and when the thighs are separated it presents a small extent of surface, but when the legs lie close together the space is reduced to a deep groove. The front part of this region is occupied by the vulva, or external genitalia, the back part by the anus, while between these two is a small body composed of skin and muscle, called the *perineum*.

The Vulva (Fig. 16).—This is made up of two more or less heavy lips or labia—the *labia majora*—composed of skin and fat, covered with hair, and abundantly supplied with sebaceous glands. The labia terminate anteriorly in the *mons veneris*, a pad of fat covering the pubis. Behind they spread out in the *perineum*. Beneath and between the labia majora are two smaller labia, called, in contradistinc-

tion, the *labia minora*, made up of thin skin and mucous membrane. Anteriorly the labia minora meet and form a hood, which covers a little erectile organ, the *clitoris*; posteriorly they disappear at the sides of the outlet of the vagina. The clitoris is attached to the under surface of the pubis, and is a little elongated mass of blood-vessels covered by mucous membrane. It is protected by the hood aforementioned. It is very sensitive. Under the hood,

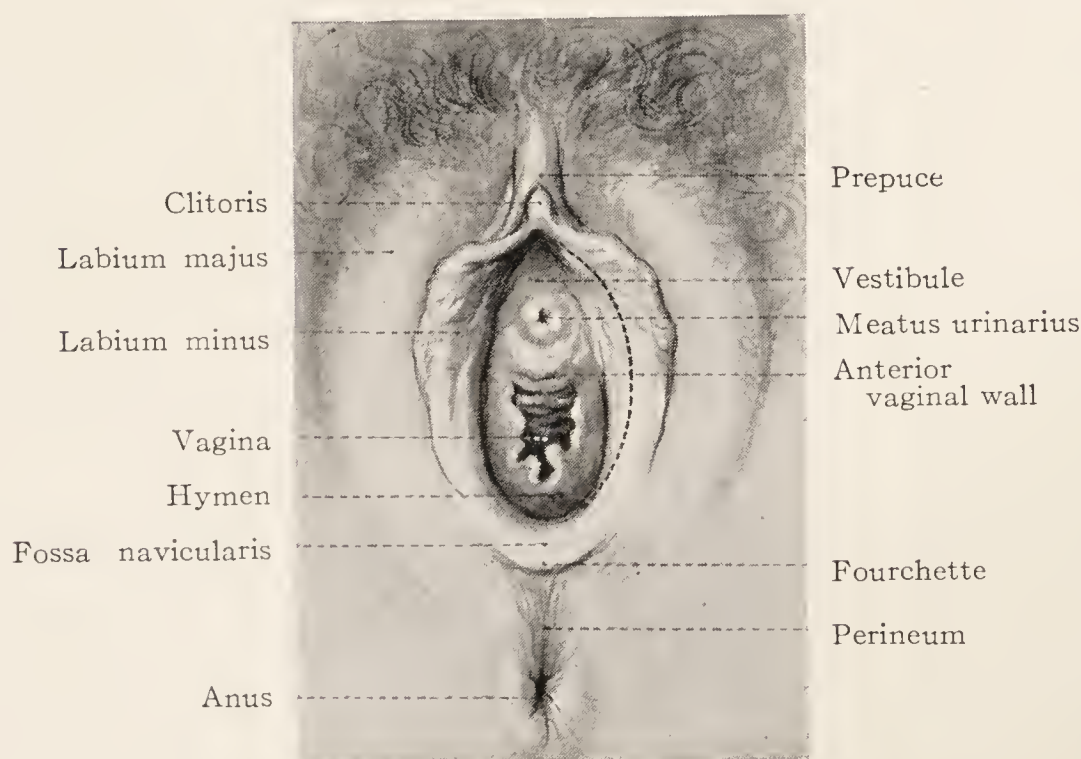


Fig. 16.—Diagram of female external genitals.

smegma, a whitish, flaky material, being the dried secretions, is likely to collect and form a lodging place for germs, an important point for the nurse to know. It is a serious error of technic for the nurse to leave smegma under the hood of the clitoris in her preparation of the patient for labor or operation.

Below the clitoris is a flat, triangular area, covered by mucous membrane—the *vestibule*—at the lower part of which are two little raised ridges with an opening between them—the mouth of the urethra, the *meatus urinatus*—through which the urine is voided.

Below this opening is the outlet of the vagina, surrounded by a fringe of mucous membrane called the *hymen*. The

hymen lies at the opening of the junction of the vagina with the vulva, is a thin, circular structure, and tears when the child pushes through if it has not been torn during the first conjugal relation. The shape of the hymen varies in different women: some have hardly any; in others it covers the opening of the vagina and may have only a pin-hole perforation, or, in rare cases, no opening at all. It may be sickle shaped or have several perforations.

Between the hymen and the terminations of the two labia majora in the perineum is a boat-shaped depression—the *fossa navicularis*; and at the junction of the two labia majora is the posterior commissure or *fourchet*, a band of skin forming part of the fossa navicularis.

The Perineum.—This is the body between the vagina and the anus. It is composed of skin, connective tissue, and muscle, separating the vulva from the anus. Since the vagina leads forward and the anus backward, there is a triangular space between their outer terminations. This space is filled up by the triangular *perineal body*. During labor, when the head comes down through the vagina, it stretches the vulva open and pushes the perineum backward against the anus and rectum, flattening it out. During the passage of the child the perineum is often torn, which is unfortunate, as the integrity of the tissues and organs above it is partly dependent upon this structure. Of more importance are the tears of the pelvic floor, which are hard to find and are usually overlooked by the general practitioner. When the perineum is torn deeply the anus and rectum may be laid open. This is a sad accident, as the woman may thus lose control of the bowel. Immediate repair of all injuries should be made if possible.

The Anus.—About $1\frac{1}{2}$ inches below the fourchet is a deep, pigmented, puckered opening—the *anus*. This is the outlet of the rectum. The skin of the perineum dips down into the anus a short distance to meet the mucous membrane of the rectum. Underneath the skin and mucous membrane

lies a network of large veins. If these veins become over-distended with blood, as occurs sometimes during pregnancy and labor, but especially in the puerperium, they form very painful masses, called *hemorrhoids*, or piles.

The anus is held closed by a circular muscle, in size and shape not unlike a broad wedding ring—the *sphincter ani*. This muscle controls the passage of feces and gas. It is occasionally torn during delivery, the so-called “complete laceration,” and if not successfully repaired allows the rectal contents to escape unhindered. This condemns the patient to social ostracism, and the accoucheur, therefore, bends every effort to preserve this small but important muscle. The mucous membrane of the rectum is very sensitive and easily injured, which should warn the nurse to use care with enema points, and when making rectal examinations.

THE BREASTS

The breasts belong to the genitalia, since they take an important part in generation. They are located over the anterior part of the chest, but in very rare cases may be located in other parts of the body or be more than two in number. One woman had five—on the chest, back, side, and thigh. They are glands modified from skin glands to perform a different function, and belong to the compound racemose, clustering type. Each breast is made up of lobes; these are divided into lobules, and each lobule is composed of minute cells or *acini*. A tube from each lobule leads into a main canal, which opens on the surface of the nipple as a fine duct. These tubes collect the milk from the acini and discharge it through the nipple (Fig. 17). Before opening on the nipple each duct enlarges, forming a spindle-shaped cavity, called the *sinus lactiferus*.

Each lobe of the breast may be likened to a bunch of grapes, and the milk-ducts to the stems. Each breast has from fifteen to twenty lobes, and the ducts leading from

these lobes are all brought together in the nipple. Between the lobes or bunches the irregular spaces are filled with fat and connective tissue. The gland rests on a bed of connective tissue, which separates it from the chest muscles, ribs, and intercostal spaces. The outside of the gland is covered by skin which is more delicate than that of the remainder of



Fig. 17.—Semidiagrammatic section of a functioning female breast.

the body, and allows the blue veins to show through. The *nipple* is raised $\frac{1}{4}$ to $\frac{1}{2}$ inch above the surface. In brunets it is darkly pigmented, in blondes it is pink. At its base is a circular area, likewise pink or pigmented—the *areola*. This area contains small nodules, the *tubercles of Montgomery*, which grow more prominent during pregnancy. These are little glands, and occasionally a few drops of milk may be squeezed from them. They also are liable to infection.

CHAPTER II

PHYSIOLOGY

THE FUNCTION OF REPRODUCTION

Ovulation.—The main function of the ovary is the production of ova or eggs. It possesses other functions, but they are imperfectly understood. It is a ductless gland and, under the influence of the hypophysis cerebri, elaborates an internal secretion which circulates in the blood and affects every tissue in the body but particularly the uterus and its lining membrane, the endometrium. The ovary works with the thyroid and other glands, all of which interactions show themselves in the bodily functions and which we are only now just beginning to understand. Some of these manifestations will be described under puberty and menstruation, these being the two most striking evidences of ovarian activity.

The ovary of a newborn child contains 36,000 to 200,000 ova or eggs. They are unripe and remain dormant until the girl is eight or ten years old when they begin to develop, one at a time, and are periodically expelled from the ovary. This function is called ovulation. Ovulation is the ripening of the ovum and its discharge from the ovary. It begins during childhood, but reaches full development after puberty. The tiny egg, less than $1/125$ inch at this time, begins to grow; its little egg case, or follicle, fills with fluid and approaches the surface of the ovary; as the result of overdistention the follicle (named graafian, after the discoverer, Reginald de Graaf) bursts and the ovum escapes. It is carried into the fallopian tube and down into the uterus, or it is lost in the peritoneal cavity.

The empty graafian follicle is filled with a blood-clot; this is permeated by cells carrying a yellow pigment

(lutein, similar to the coloring-matter of carrots) and the follicle is transformed into a yellow body about the size of a hazelnut. It is called the corpus luteum. If pregnancy follows this ovulation the corpus luteum persists, and is absorbed only after the baby is born; if pregnancy does not follow, the yellow body is absorbed in a few weeks, leaving only a tiny dimple in the ovary.

The corpus luteum has important duties, but we know little about them. We believe its internal secretion, or hormone, prepares the mucosa of the uterus for the implantation of the ovum, that in some way it favors the growth of the fetus and placenta, that it stimulates the breasts, inciting them to activity, and that it checks further ovulation and menstruation during pregnancy, while it also causes some of the general changes of gestation, *e. g.*, those of the blood and metabolism.

Ovulation occurs every four weeks, but it may be irregular. It bears a certain relation to menstruation and is probably causative of the latter, although numerous contradictory phenomena have been observed which forbid the assumption of this interdependence.

Puberty.—At birth a girl and boy baby are much alike. A close study will show small differences; the boy weighs on the average $\frac{1}{4}$ pound more, the head is a little harder and larger, absolutely and also relatively to the body; the girl's pelvis is larger and shallower than the boy's.

During the first years the characteristics of the sexes gradually become more marked, and as soon as the child walks the differentiation becomes apparent. The girl develops mentally and physically earlier than the boy, and one can sooner discover in her those traits of the female that distinguish it in later life. Sexually the differences are less marked until the age of eight to ten years, when in the girl a change begins. In the boy it is noticed a few years later. The transformation becomes more apparent at the age of about fourteen years. It is called puberty, and

may be defined as that period in the life of the individual when it becomes capable of reproduction. The changes are more rapid and marked in the female—indeed, her sexual life is more intense and plays a greater rôle in her existence. Madam de Stael said: “*L’amour n’est qu’une épisode de la vie de l’homme; c’est l’histoire tout entière de la femme.*” Love is only an episode in the life of a man, it is the whole story of the woman.

The girl passing into womanhood changes physically and psychically. The hips broaden, the limbs round out with fat, and the angularity of the body is replaced by graceful curves. The general carriage of the body is more womanly and dignified. The breasts enlarge, become more prominent, fuller, and firmer, the result of growth of the gland tissue and the addition of fat; the nipple becomes more prominent; the primary areola develops. The skin shows marked changes; its activity is increased, that of the sebaceous glands particularly, so that not infrequently comedones and acne result. The hair takes on more luxuriant growth, and it also develops on the mons pubis and axillae; striae—fine lines—sometimes appear on the thighs, and especially on the breasts. These striae are due to the stretching of the skin with deposit of fat. They at first appear as purplish lines, but after several years turn a silvery white. The external genitalia grow larger, darker, more vascular, have more secretion, and emit a faint characteristic odor. The thyroid enlarges, the larynx changes, especially in the male. In the female the voice also is altered, becoming fuller, lower in scale, and more melodious. In brunets the tendency is toward a contralto; in blondes, toward a soprano range.

The mind undergoes alteration in its three parts—the will, the intellect, and the emotions. The will, especially during the change, becomes uncertain, and the girl loses to a good extent her control over it. Hysteric manifestations are quite common. The intellect broadens; new per-

ceptions give a grander conception of life. The girl feels that a great transformation is taking place in her being, and the pride of womanhood and of anticipated wife- and motherhood swells in her. The emotions during the period of change also become unstable: the girl laughs and cries often without reason, is happy, gay or sad, and melancholy without cause. The inclination toward the male increases, while at the same time a sense of modesty and shyness appears.

This transformation is the outward expression of the changes occurring in the internal organs of generation and in the ductless glands. The uterus is developing rapidly. The vagina and the tubes grow longer, the ovaries take on a special activity, ova develop, the graafian follicles enlarge—in short, ovulation begins. With ovulation comes the ability to reproduce, but the girl at puberty is unfit to bring forth children. Cases are on record where girls of ten and even nine years bore large children. Plato set twenty years as the best age for the first child, and Wernich, from a study of the development of the children of young women, decided on the age of twenty-three as best. At this time, also, the pelvis has achieved its full development; the bones are still somewhat elastic, the joints supple; the coccyx, particularly, can be pressed back, and the genital tract is soft and elastic, while the woman is also more fully evolved morally and psychically.

The time of the advent of puberty, and with it, the menses, depends on many conditions. Warm climate seems to develop the female early, the equatorial women having their periods before the twelfth year, while the Laplander is free until the seventeenth to the twenty-third year, and some of the Eskimo women menstruate only in summer. Girls living in luxury and amid stimulating surroundings menstruate early—the poor girl, the country girl, the tuberculous—late.

Menstruation may be defined as the occurrence, every four weeks, of a discharge of blood from the genitals,

attended by general symptoms of malaise and disturbed nerve equilibrium and local symptoms of congestion of the uterus and neighboring organs. The uterus presents most marked changes during menstruation. It is enlarged, softened, and turgid with blood. The mucous membrane is much thickened, soft, presenting a deep red, velvety appearance. Blood oozes from the surface, mixes with the natural, but augmented secretions from the whole genital tract, and, altered in color and odor, escapes from the vulva. After from three to seven days the discharge ceases, the tumefaction of the uterus and mucosa disappears, and the latter has resumed its smooth pink appearance.

We know that the mucosa undergoes a succession of changes, of which four are distinguishable and which make up what is called a menstrual cycle. The *first stage* is one of preparation; the endometrium becomes thick, red, velvety—due to increase of the tissues, of the blood-supply, and of the activity of the uterine glands. This preparation of the surface is called “nestbuilding,” its purpose being to favor the attachment of the expected, fertilized ovum. If pregnancy fails the ovum does not attach itself to the mucosa, menstruation occurs and the little egg is washed out with the flow. Nature now restores previous conditions.

The *second stage* is the period of visible menstruation and lasts three to seven days. The newly formed lining of the uterus degenerates, the glands pour out abundant secretion, a slight desquamation occurs, attended by an oozing of blood from the dilated blood-vessels—all of which make up the menstrual discharge.

The *third period* is one of regeneration; the engorgement subsides, the lymph is absorbed, and the endometrium becomes pink and smooth again. This stage lasts three to four days. The *fourth period* is one of quiescence, lasting only a few days. During this time the ovary is preparing another graafian follicle and ovum, ready to start the process all over again.

The *symptoms* of menstruation are so variable that one cannot tell when the normal passes over to the pathologic. The majority of women complain of no more than a sense of heaviness or bearing down in the pelvis, or backache, with a little general malaise, but many have headache, neuralgia, chilliness, flashes of heat and mental irritability, which in the nervous may amount to hysteric attacks. The skin is sometimes affected, there being a slight odor to the sweat, and eruptions, pimples, urticaria, etc., appearing. The women are also subject to colds, show rings around the eyes, and are sometimes pale or flushed. The latest investigations show that germs may enter the blood. The breasts may tingle or pain a little and, rarely, a few of the signs of early pregnancy may be found.

While the usual interval between periods is twenty-eight days, the menses in some women recur every twenty-one days, or twenty-four, or thirty, still being normal. The duration of the flow is two to seven days, the average being five days. Women of warm climates flow more and longer than those of the north, and the factors which bring on early menstruation usually increase the amount and duration of the flow. During pregnancy and in about half of the cases during lactation the menses are absent.

The discharge is at first mucoserous, then bloody, of a maroon color, and an odor like marigold. The amount should not be more than 6 to 8 ounces, but sometimes a woman loses much more apparently without suffering loss of health. The nurse should remember that the menstrual blood is laden with bacteria and is therefore infectious for a puerperal woman.

The phenomenon of menstruation and the coincident changes of ovulation are related in some way. The present theory is that there are two hormones in the anterior pituitary which act on the follicles in the ovary, which in turn, through other hormones act upon the uterus, stimulating it to undergo those changes we learned under Menstruation.

These hormones are found in the urine of pregnant women and by injecting the latter into mice, rats, and rabbits, peculiar changes in the ovaries may be directly observed. They constitute the *Aschheim-Zondek pregnancy test*. When the corpus luteum regresses (conception having not occurred) the mucosa regresses too. Why and if the corpora lutea are formed about every four weeks we do not know.

Menstrual anomalies cannot be fully discussed in a small obstetric text-book, but a few words may be permitted to show how they may call the attention of the accoucheur to conditions which might have a bearing on childbirth. For example, a woman with dysmenorrhea may have a long narrow cervix which will not dilate during labor, or she may have retroflexion, which may cause abortion; one with profuse menstruations may have a fibroid or endometritis which may cause mechanical dystocia, or placenta praevia; one with amenorrhea may have thyroid deficiency and may be undeveloped sexually, possessing a small pelvis. For the nurse these facts may be of importance if it be one of her duties to fill out the history on the antepartum record.

The *menopause*, or "change of life" or "climacteric" is the time of cessation of the menstrual function, and also, frequently, of sexual activity. It takes place as early as the twenty-fifth year and as late as the hundredth in rare instances, but usually from the thirty-sixth to the fifty-fifth years, the largest number of women "losing their periods" between the forty-fifth and fiftieth years. The reproductive era, therefore, of a woman's life is about thirty years, though cases are on record of children being born to women over sixty. Women who menstruate early "change" late. Sometimes the periods reappear after an absence of variable length, but usually the flow gradually diminishes in amount, becomes irregular, and ceases entirely in the course of six months to one year.

In healthy women the symptoms of the menopause are not marked, but in neurotics there may be distressing flashes of heat and cold, flushing of the face and body, nervous and mental excitability, indigestion, constipation, etc., and many of the symptoms which mark the beginning of the function. The body usually puts on fat which often hangs in ungainly masses on the back, buttocks, or abdomen; hair often appears on the face and the person takes on more of a masculine type. All these symptoms are due to atrophy of the ovaries and uterus and also to changes in other endocrinal glands, the thyroid, pituitary, etc.

Profuse menstruation and flow between the periods are seldom normal, and since these discharges usually come with carcinoma or

fibroid, the physician should be consulted. This is advisable for all the so-called symptoms of the menopause, since the laity is too prone to ascribe such manifestations to a normal function when serious underlying disease may exist, and by delaying treatment the opportunity for successful treatment may be lost.

Conception.—The union of the female element, the ovum, with the male element, the spermatozoid, is called

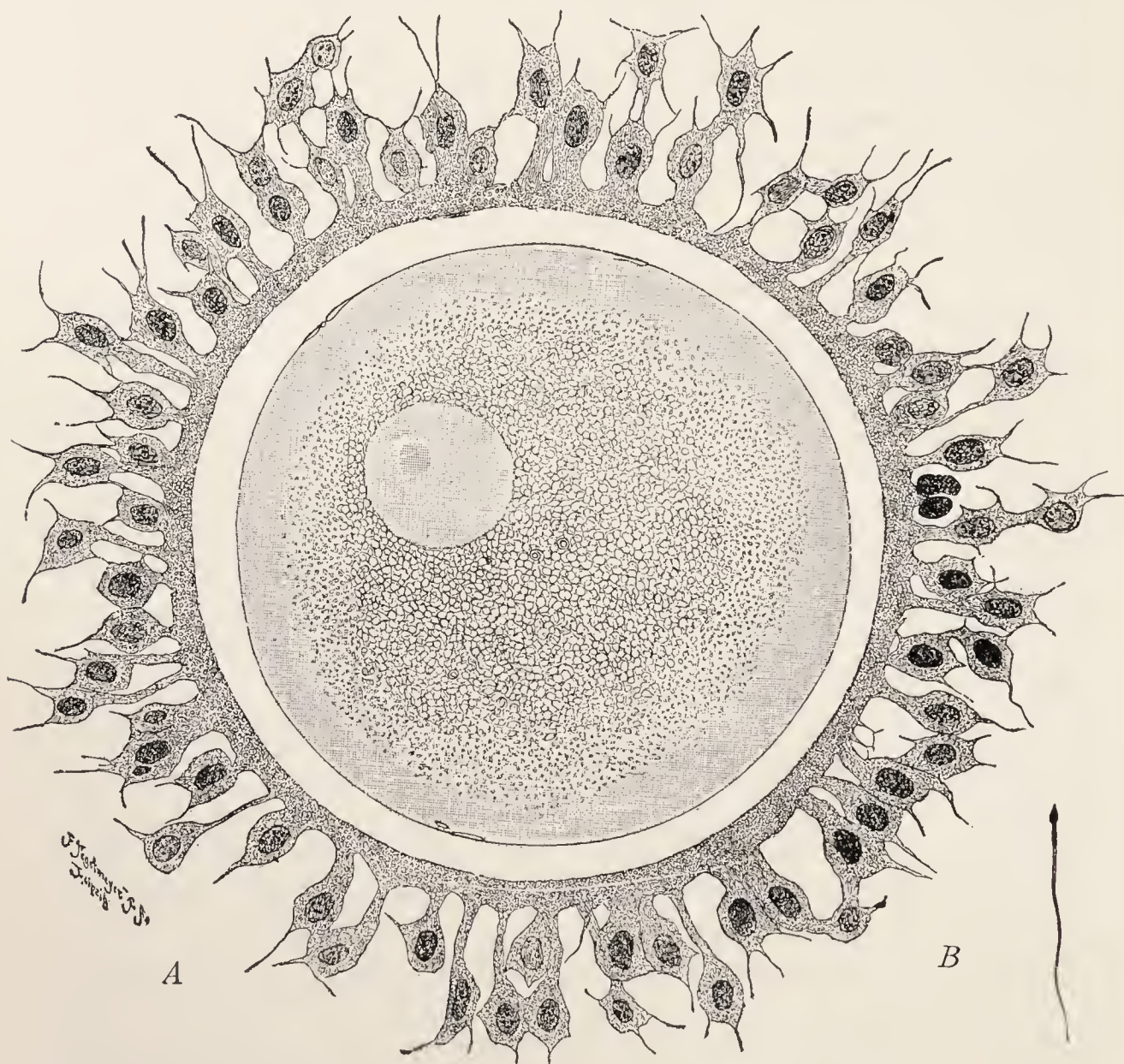


Fig. 18.—A, human ovum surrounded by cells of the corona radiata. B, a human spermatozoid magnified correspondingly (Waldeyer).

fertilization, fecundation, impregnation, or conception. The human ovum is so small that it can hardly be seen by the naked eye, $\frac{1}{125}$ inch in diameter (Fig. 18). The spermatozoids are microscopic in size, $\frac{1}{450}$ inch in length, and

100 could pass, side by side, through the eye of the finest cambric needle (Fig. 19). They are endowed with the power of locomotion by the sinuous winding of the long thin tail, and thus they quickly pass up from the vagina through the uterus to the tube.

There are over 200,000,000 spermatozoids in each ejaculation. Since only one is used for fertilization we see how extravagantly nature provides for the perpetuation of the race. The remaining sperms perish, or, some



Fig. 19.—Human spermatozoids highly magnified.

investigators think, penetrate the mucous membrane and influence the woman's system in some undefined manner.

The meeting of the spermatozoid with the ovum may occur in the tube or in the uterus—presumably in the tube. After it occurs, and only then, the ovum thus fertilized readily becomes attached to the velvety uterine mucosa. No menstruation occurs, and the mucosa undergoes the modification incident to pregnancy. The woman is now pregnant, and mighty changes are inaugurated in the little ovum clinging weakly to the mucous membrane of the uterus, and also in nearly every part of the woman's body.

The time of conception is unknown. Clinical experience shows that it may occur at any time of the month, but probably most conceptions

date from the middle—when the graafian follicle usually ruptures. The ovum may be fertilized by a spermatozoid lying in the tube waiting for an ovum to ripen. Nor do we know what determines the sex of the child. Some investigators hold it is predetermined in the female ovum, others in the spermatozoid, others still that it is settled at the time of conception. That it is not chance is proved by the fact that the proportion of boys to girls born, the world over, is 105 to 100. The Allwise Creator has some law governing this which He hides from human understanding.

Nevertheless humans have tried to discover the secret and to predict, even to influence the sex of the child, but to no avail. Siegel, studying 300 cases where the husband returned from the war on furlough found that, if the impregnation occurred during the ten days after the menses, 84 per cent of the babies were boys; if it occurred from the fifteenth to twenty-fifth day afterward, 86 per cent were girls. My experience only partly confirms this statement.

At the very beginning the ovum is a tiny vesicle, just visible to the naked eye; in two weeks it has grown to the size of a large pea, and in four weeks to that of a walnut.



Fig. 20.—Ovum of three weeks' pregnancy in sac (natural size). Note the fine shaggy coat, the thread-like villi.

It is a sac covered with a shaggy coat of delicate branched threads called *villi*. (See Fig. 20.) These villi dip into the uterine surface and bring nutrition and oxygen from the mother to the child. At this time the child is hardly recognizable as such. At eight weeks the ovum has attained the size of a lemon, and the surface has become differentiated into a protecting part and a nutritive part—the former consisting of a thin, greenish, glistening, veil-like membrane, the latter a thick woolly mass occupying half of the surface. (See Fig. 21.) This is the future placenta which provides

the fetus with nourishing materials and removes its waste. The placenta is a compact mass of closely intertwined villi, attached to the interior of the uterus, usually near the top, and connected with the belly of the fetus by the umbilical cord or funis. The sac made of the placenta and membranes contains a fluid in which the child floats. It also shuts the interior off from the outside world. The fluid



Fig. 21.—Six weeks' ovum in sac (natural size). The little fetus, about the size and shape of a kidney bean, is inside the translucent sac.

is called *liquor amnii*. The child at this time is completely formed; it is about $1\frac{1}{4}$ inches long, the head being nearly as large as the rest of the body.

At sixteen weeks the ovum is about as large as a man's two fists, and presents in miniature all the appearances of the ovum at term. At nine months, or "term," or "full time," the completion of pregnancy, the uterus resembles in size and shape a watermelon. The child lies in it, usually with head down, completely formed, ready for delivery.

(See Frontispiece and Plate II.) The placenta is well developed, lying usually on one side of the uterus, far from the internal os. The *umbilical cord* connects the placenta with the child; it is as thick as the little finger and much twisted. In its course two arteries and a vein held by a jelly—called Wharton's. The liquor amnii is usually

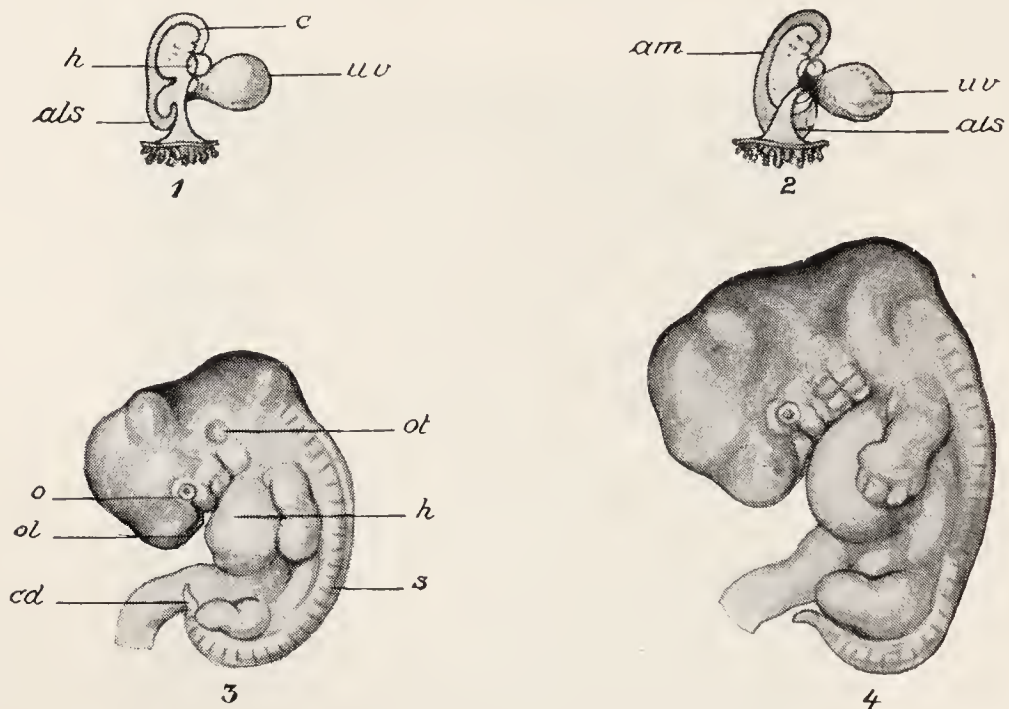


Fig. 22.—Early human embryos, all enlarged about two and a half times: 1, Second week; 2, third week; 3, fourth week; 4, fifth week; *am*, amnion; *uv*, umbilical or vitelline vesicle; *als*, allantoic or abdominal stalk; *c*, brain-vesicles; *h*, heart, *o*, optic vesicle; *ot*, otic vesicle; *ol*, olfactory pit; *s*, somites; *cd*, caudal process (His).

about enough to fill up the spaces left between the body of the child and the uterine walls lying against it.

At the end of the *fourth week*, or first lunar month, the embryo is $2\frac{1}{2}$ mm. long; there is no umbilical cord but the yolk sac is prominent; the heart is a pulsating bulgy tube.

At the end of *eight weeks* (second lunar month) the embryo is 3 cm. ($1\frac{1}{4}$ inches) long. The eyes, nose, and liver are formed and the extremities are tiny bud-like processes.

At the end of the *third lunar month* the fetus is 9 cm. long (about $3\frac{1}{2}$ inches) and weighs $\frac{2}{3}$ of an ounce. The navel is closed, the navel cord well developed, the intestine contains bile, and the sex is determinable. The head is as large as all the rest of the body, the fingers

and toes are distinct, ossification begins in the bones and a few teeth may be found.

At the end of the *fourth month* (sixteen weeks) the fetus is 18 cm. long and weighs 120 Gm. (see chart). The head is still very large, the skin red and transparent, letting the network of blood-vessels show through, and is covered with lanugo. Meconium is present. The

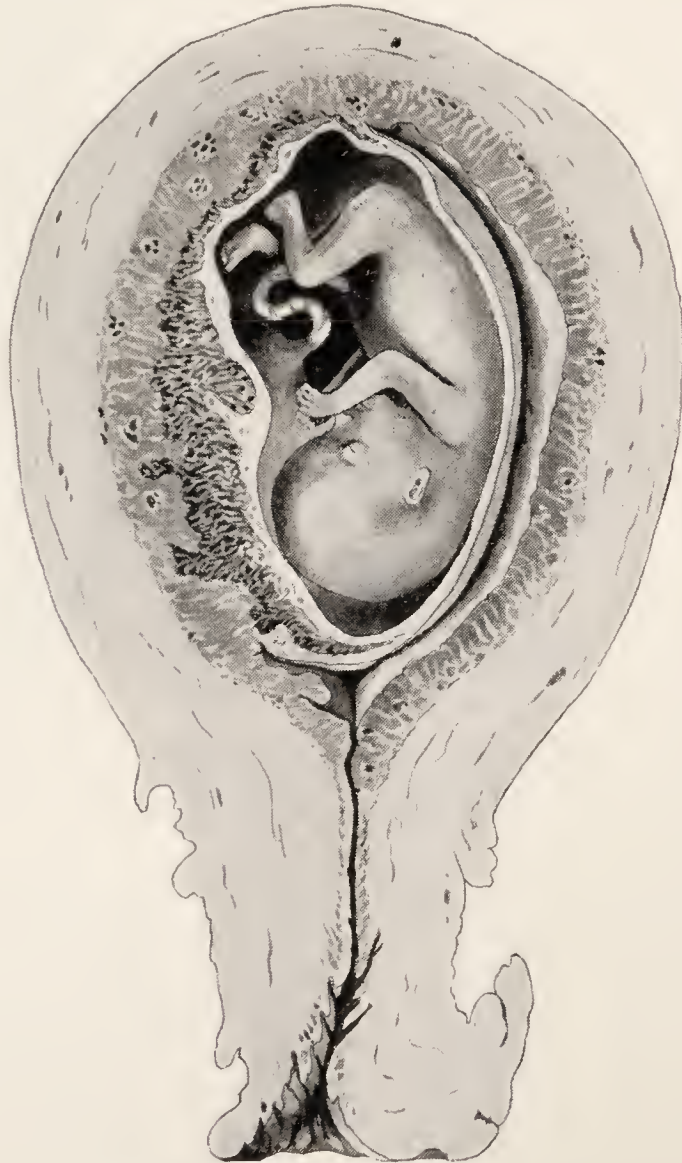


Fig. 23.—Two months' pregnancy, showing the fetus in the uterus (about $\frac{2}{3}$ ds natural size).

fetal heart beat and active fetal movements are also so distinct that they can be heard with the stethoscope.

At the end of the *fifth month* the fetus is 25 cm. long and weighs 250 to 280 Gm. The head is still large but the abdomen is less prominent, the skin less red, though there is very little fat in it. Nails and hair are indicated. Such a fetus may live a few minutes with a beating heart and a few gasps.

At the end of the *sixth month* the fetus is 28 to 34 cm. long and weighs 645 Gm. ($1\frac{1}{4}$ pounds). Its body is better proportioned but is still lean. Vernix caseosa begins to form, the eyelids are separated. It may live a few hours but, because the lungs and the digestive organs



Fig. 24.—Fetuses of the second, third, and fourth months of pregnancy (three-fifths natural size).

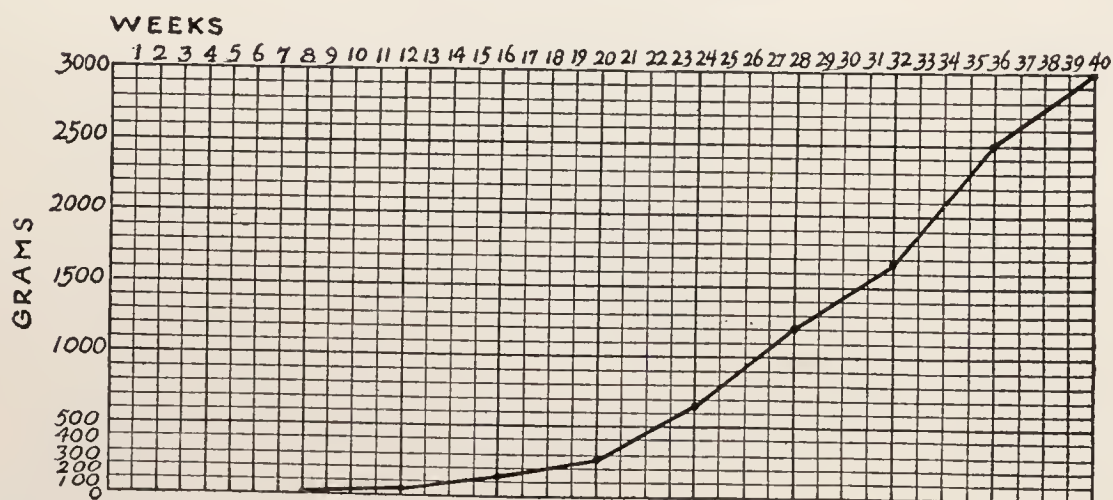


Fig. 25.—Graph showing increase of weight by weeks during intra-uterine life.

are undeveloped, no artificial means will save it from congelation and starvation. We cannot believe reports of the saving of such infants.

At the end of the *seventh month* the child weighs 1000 to 1220 Gm. ($2\frac{1}{2}$ pounds) and is 35 to 38 cm. long. The skin is red and fuzzy and

becomes wrinkled soon after birth. The eyes are open, the testicles usually in the scrotum. The cry is weak, whining, or grunting. Since the lungs and intestinal canal are not developed, such children usually die. Occasionally a child at this period has attained a greater growth than one of eight months and will survive. Fetuses of twenty-five to twenty-six weeks very rarely live and if they do are prone to develop hydrocephalus or paralysis, or they remain puny. Every additional day at this stage counts much for viability.

At the end of the *thirty-second week (eighth lunar month)* the baby is 43 cm. long, weighs 1600 Gm. ($3\frac{1}{4}$ –4 pounds). The body is less lean, the skin less red, the bones are firmer, the skull bones too, because of more advanced ossification. The cry is stronger, and such children can usually be raised, with mothers' milk and good nursing, with or without the incubator.

At the end of the *ninth lunar month* the baby weighs 2500 Gm. ($5\frac{1}{2}$ pounds), its length is 46 to 48 cm. The lanugo is less in evidence, the little body is more rounded out with fat. The nails are at the tips of the fingers. All the vital organs are developed so that an extra-uterine existence is probable, though good nursing care is required to develop a robust constitution for the little one.

At the end of the *tenth lunar month*, the child is "ripe" or "at full term." It weighs 3100 Gm. (7 – $7\frac{1}{2}$ pounds), has firm flesh, a pink skin, a vigorous cry, and all the life functions are in activity. The placenta weighs $1\frac{1}{4}$ pounds and there is about a quart of liquor amnii, the whole ovum and uterus altogether weighing from 11 to 14 pounds. Boys average $\frac{1}{4}$ pound more than the girls. The boys, therefore, give more trouble in delivery, and consequently more of them die. The first child is usually smaller than subsequent children; 10-pound babies are rare, and children weighing over 12 pounds at birth are very exceptional.

The length of the child is about 50 cm., or 20 inches, and this is a more certain index of the maturity of the child than of the weight. On one day, the author delivered a ten months' child weighing $3\frac{1}{4}$ pounds and one of eight months' gestation weighing $8\frac{1}{2}$ pounds. Many conditions influence the size of the baby, *e. g.*, large size of parents, age of mother, good general nutrition of the mother, the white race, broad healthy placenta, favoring large children,

the opposite making for punier ones. The endocrine glands have an influence.

The *head of the fetus* throughout pregnancy is markedly developed, and during delivery usually gives more trouble than the body. The vault of the skull is made up of four bones: at the sides are the parietal bones; at the front, the frontal; at the back, the occipital bone. The bones forming the vault of the cranium are not joined fast together as in the adult, but are connected by soft membranes, leaving

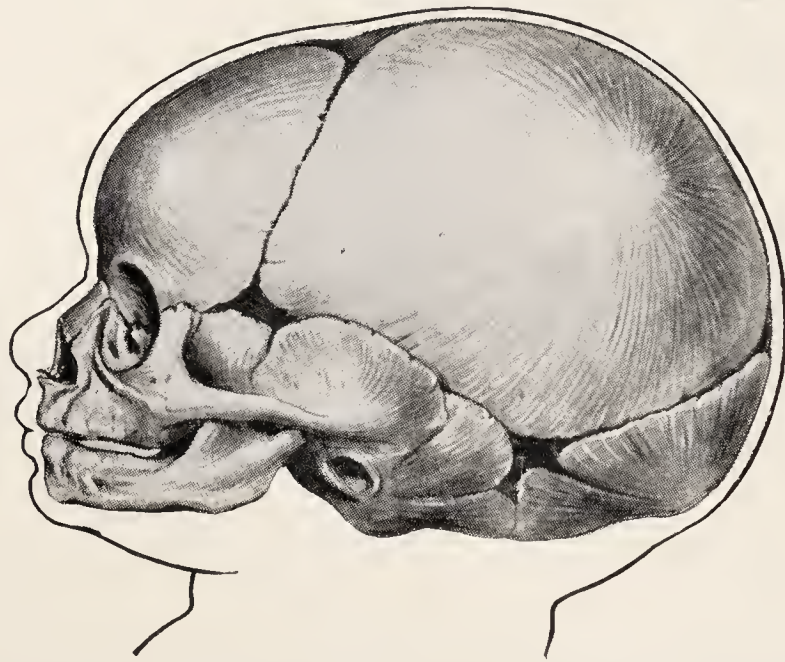


Fig. 26.—Fetal skull at term showing fontanel. Side view showing the coronary suture to left, the lambdoid below and to the right, the lateral suture below and in the center (Dickinson).

sutures and *fontanel*s at their contiguous borders (Figs. 26, 27). Between the parietal bones is the sagittal suture; between the parietal and occipital bones, the lambdoid suture; between the parietal and frontal bones, the coronary, and in the frontal bone, the frontal suture. Where the two parts of the frontal and the two parietal bones meet lies an open, four-cornered, lozenge-shaped space filled in by membrane, called the *anterior* or *large fontanel*, and where the parietal and occipital bones meet lies the *posterior* or *small fontanel*. This is really no opening, but the meeting of three sutures. This arrangement of bones, sutures, and

fontanel is designed to allow the head to mold and adapt itself to the mother's pelvis during labor, so that it may pass through with the least resistance and injury to both head and pelvis. After a prolonged labor in a primipara the head is sometimes drawn out almost to a sausage shape. Should the child have been delivered with the face first, a corresponding molding takes place and the head assumes

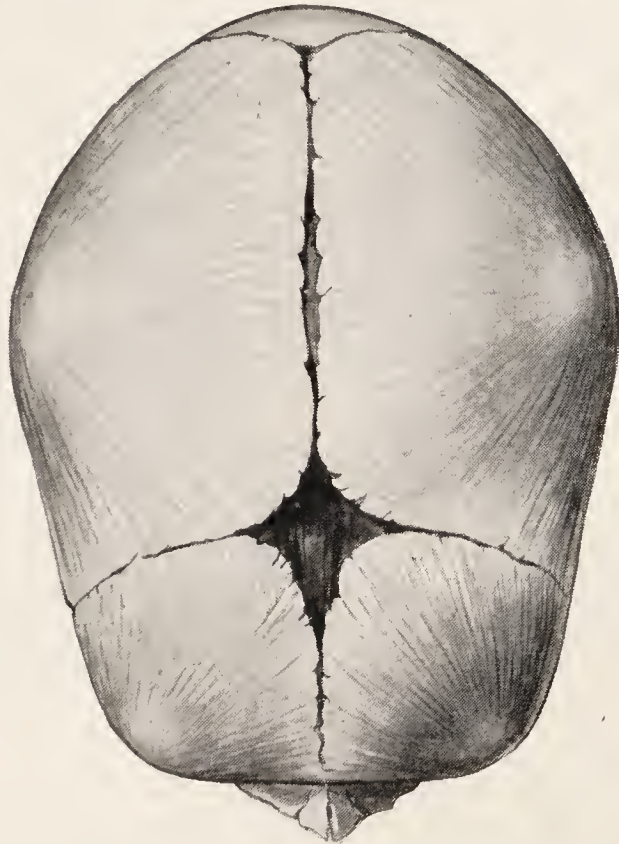


Fig. 27.—Fetal skull at term. Seen from above and showing the small fontanel, Y shaped, at upper pole of figure; the large or anterior fontanel, diamond shaped, below; the sagittal suture in the center; the coronary suture at the sides of the large fontanel; the frontal suture leading down from the large fontanel (Dickinson).

a different form. The mother may be alarmed at the distortion of the child's head, but the nurse may reassure her that within a few days the bones will straighten out and resume their proper relations, the overlapping sutures will broaden and the deformity entirely disappear.

The child in the uterus lies comfortably: the legs are lightly bent on the thighs, the thighs on the belly, the forearm on the arm, the arms across the chest, the head bent

down over the breast (Figs. 28, 29). There are not infrequent changes in the attitude of the child, for example, the chin may leave the chest and be stretched upward, in so-called face presentation, or the arms may leave the chest and



Fig. 28.



Fig. 29.

Figs. 28 and 29.—Side and front views of the fetus, showing the attitude it holds in the uterus. There is usually so much liquor amnii in the uterus that the fetus can stretch out its arms and legs freely. Note how fetus on left has the cord around its neck and body.

prolapse before the head. Sometimes the child presents itself for delivery with the breech first, or with the shoulder, as we will learn later.

THE PHYSIOLOGY OF THE FETUS IN THE UTERUS

The general metabolism of the child is similar to that of the adult. The fetus has, however, no respiratory function, very insignificant digestive action, and little skin function, since these are hardly necessary, its mother performing them for it. It has its own heat-producing and regulating

mechanism, as is shown by the fact that the child's temperature is $\frac{1}{2}$ degree higher than that of its mother. The nurse will learn from the chart (Fig. 25) that the weight of the fetus grows rapidly from the twentieth week.

It gets oxygen from the mother through the placenta, also water and food prepared for assimilation. A small portion of food comes from the liquor amnii which the infant swallows. The waste-products from the child, and the carbon dioxid which the adult exhales from the lungs, in the infant pass through the placenta to the mother, and are excreted by her organs. All this is accomplished by way of the placenta.

The Placenta.—This organ resembles a flat cake. The umbilical cord leading from the child is inserted on one side, while the other is attached to the inner surface of the uterus. The mother's blood flows in and around the placenta. After the child is delivered the placenta is dislodged from the wall of the uterus and expelled. This important organ is made up of a number of lobes, each lobe containing a large number of trees of chorionic villi. A *villus* is a tiny, finger-like filament which dips into the maternal blood in the placenta and through which the above-mentioned changes take place. A description of the villi would take too many pages. Each nurse should shred or tease a piece of placenta with a pin, and float it in a glass of water, when the fine elements or villi will be prettily shown (Fig. 30).

The blood of the child flows through the vessels of the cord to the placenta, then through the inside of the villi, and the villi dip into the maternal blood, and since there is no direct connection between the blood of the fetus and that of the mother, the changes must occur by osmosis and the vital cellular activity of the wall of the villus. Water, oxygen, and food go to the fetus through the villus; carbon dioxid and waste-products go from the fetus to the mother in the same way. The villi, therefore, are like the roots of

a tree, drawing water and sustenance from the ground. The sap of the tree within the roots does not get into the ground, yet water and substance get into the sap through the outer covering of the roots. The blood of the fetus, laden with carbon dioxid and waste materials, goes to the placenta through the umbilical arteries, and returns to the child by the umbilical vein, carrying oxygen, water, and

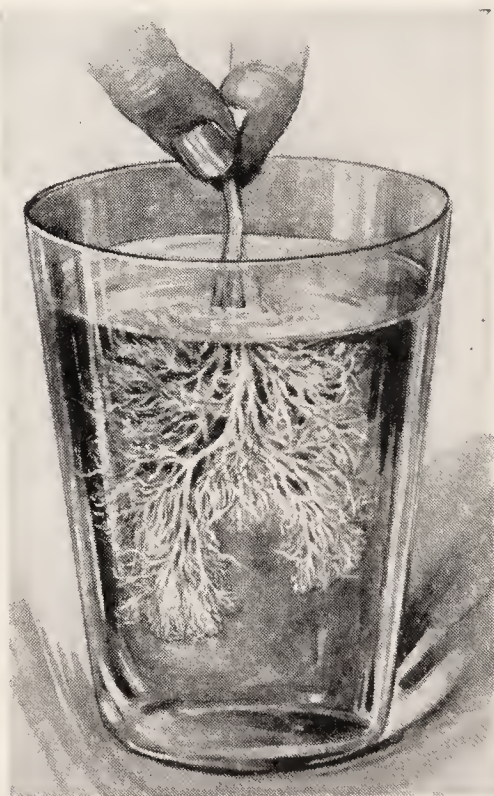
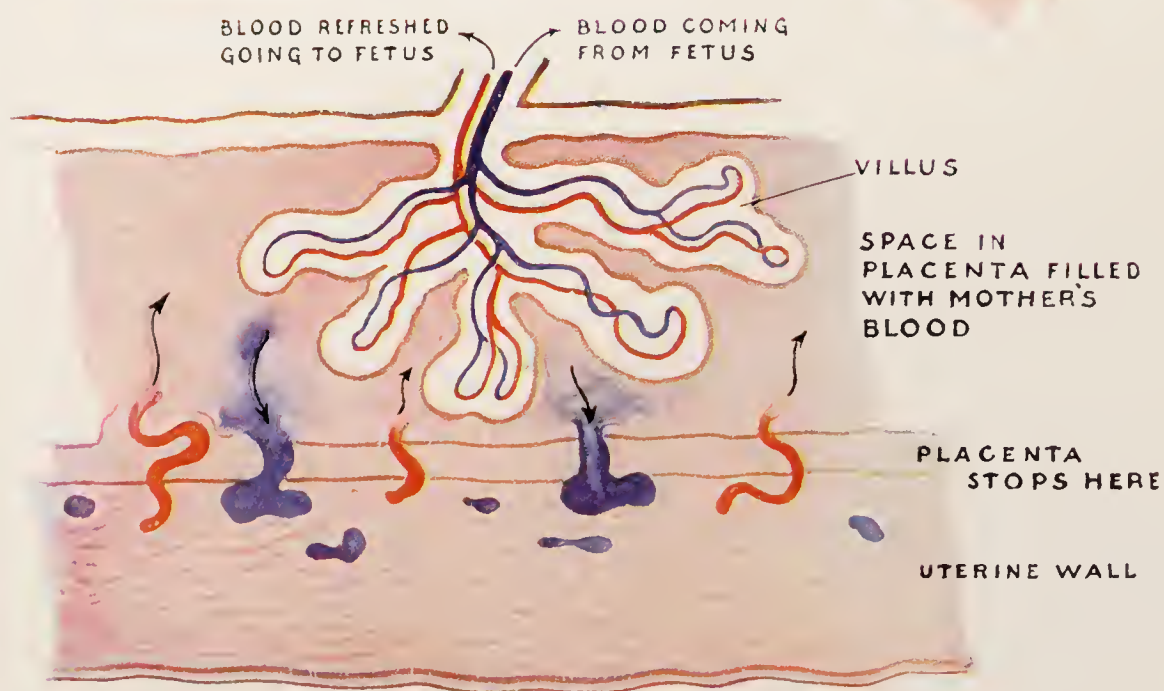


Fig. 30.—A piece of placenta teased and hung in a glass of water. The water represents the mother's blood; the fingers hold an artery and a vein which carry the child's blood to and from the placenta. There is no direct communication between the fetal blood within the branched villi and the water (maternal blood) in the glass.

food. (See Plate I.) The blood of the umbilical vein is red, while that in the arteries is venous, or dark, which is the reverse of the usual.

The liver of the child is very active, and, therefore, large. It reaches half-way to the navel. The stomach and intestines have weak digestive power. The child drinks the liquor amnii, as is shown by the lanugo which is found in the meconium. The bowels do not move in utero unless

PLATE I



Diagrams to show the relations of the maternal and fetal circulations.



the child is asphyxiated; meconium, therefore, in the liquor amnii means that the oxygen supply of the fetus has been interfered with. The kidneys secrete and the urine is voided into the liquor amnii. This action is very small indeed, and may not begin until labor has begun.

The child moves about, changing from uncomfortable positions to others. It sometimes has hiccup and it sucks its thumb in the uterus, and tiny respiratory movements are sometimes observed. The hiccup is an interesting phenomenon. The women say they can distinguish regular attacks of hiccups. The child makes rhythmic, jerky movements recurring about eighteen to the minute. Often the infant stretches, and the mother gets to know its habits, which may correspond with those after birth. The child has periods of rest and activity. Sometimes the activity is so great as to disturb the mother's rest and require treatment. The mental conditions of the fetus have been the subject of much speculation. While the child suffers pain when hurt, the sensation is not as developed during birth as it is shortly after.

CHAPTER III

PREGNANCY, LABOR, AND THE PUERPERIUM

MATERNAL CHANGES IN PREGNANCY

THE development of a new life in the uterus, the performance of the new function—reproduction—is attended with decided changes in the whole being of the woman. No part of the body fails to feel the stimulus of the reproductive function. These changes are divided into two classes: first, local changes—those found in the genitals and the breasts; second, general changes—those involving the rest of the body.

Local Changes.—Nature has to make a nest for the lodgment of the fetus, one that protects it from injury and has a stable blood-supply. She must also provide the mechanism for the expulsion of the product of conception when it is ripe and must prepare the passages—cervix, vagina, vulva—so that a free exit is given the child, without damaging the maternal structures too much. Finally she must furnish nourishment for the infant after it is born.

The alterations which pregnancy effects on the genitalia are admirably adapted to these purposes.

The *uterus* in the virgin state is small, weighing about 2 ounces. It grows during pregnancy to a sac so large that it reaches almost to the ribs, and weighs, when empty, about 2 pounds. As pregnancy advances the walls of the uterus grow thicker and more powerful, the muscle-fibers become stronger and increase in number, and the uterine muscle develops the functions of contractility and retractility to a high degree. The uterus grows of itself faster than the growing ovum distends it, and when the child is ready for delivery the uterus is a powerful hollow muscle. It expels the child

and after-birth with great force and gentleness withal. The blood-vessels also increase in size and number. Some of the veins are as large as the finger, especially those in that part of the uterus to which the placenta is attached. The lymphatics throughout the pelvis are also enlarged. The cervix, vagina, and vulva become softer, more dilatable, and actually increase in size.

The uterus is developed into a strong muscular engine, while the cervix, vagina, and vulva are prepared for the

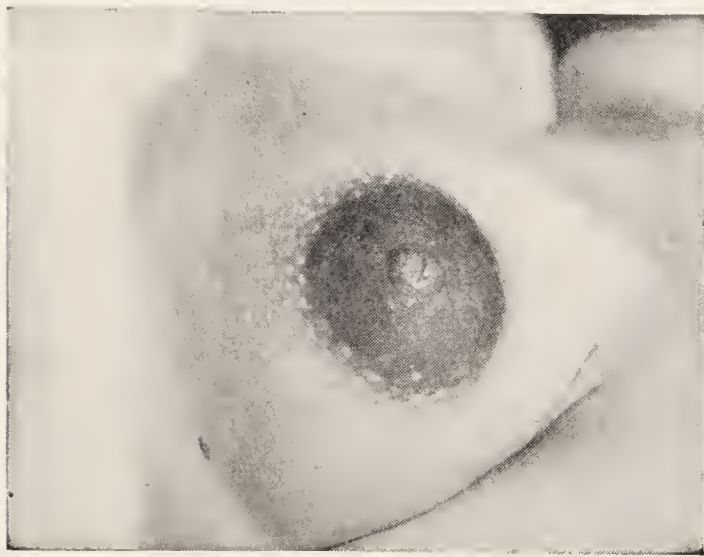


Fig. 31.—The breast in pregnancy. Brunet. Shows the primary areola and a marked secondary areola.

great distention they will suffer when the child is forced through them.

The *breasts* enlarge early in pregnancy: sometimes there are a tingling and a sensation of fulness and weight as early as the fifth week. The nipple grows and becomes more erectile. The primary areola darkens by the deposit of pigment, the tubercles of Montgomery in it enlarge, and the areola is puffy and slightly raised. (See Fig. 31.) Later in pregnancy a little clear fluid streaked with yellow can be expressed from numerous openings on the nipple. This is called colostrum. Around the primary areola sometimes a secondary areola forms. The secondary areola is

commoner in brunets, and resembles dusty paper with a sprinkling of water drops. This pigmentation of the breasts is especially marked in brunets, and in negresses the nipples may be almost black. Light purplish, radiating lines sometimes appear around the periphery of the breasts. These are called *lineae* or *striae gravidarum*, are more numerous in blondes, and, after nursing is completed, remain as fine, white, linear scars. Blue veins often show through the skin, which is a sign of good omen, as it promises a sufficient milk supply. Sometimes the breasts grow so large and heavy that some form of artificial support is necessary.

General Changes.—Every tissue and fiber in the woman's body feels the impetus of pregnancy, due probably to the action of ferments made in the placenta or corpus luteum. Mauriceau said that pregnancy was a disease of nine months' duration. This is not strictly true, though many women suffer much throughout the whole period. Many women feel best while pregnant, and some are permanently benefited. Pregnancy tests the integrity of every organ in the body, and if any one of them is diseased the fact will usually be brought out, *i. e.*, it will break down under the strain. The nurse may now see how important it is for her to know the physiologic changes of pregnancy in order that she may recognize pathologic variations. Prenatal care, now so prominent a part of the obstetric nurse's service, consists largely of watching for symptoms of such organ break-downs.

The changes in the physiology of the woman, about to be described, are her reactions to the demands made upon her system by the growing child. They are, therefore, only temporary. All her functions—digestion, respiration, elimination, and the intricate processes of metabolism—are altered and adapted to supply the child with food, water, and oxygen, and to make over its waste into harmless compounds which the mother's excretory organs can get

rid of. Disturbances of these particular adaptations result in the dangerous toxemias which we shall study later.

The *blood* is increased in amount in the last months of pregnancy and its clotting power augmented, nature thus preparing for the loss of blood during labor. The heart is a little enlarged; the veins of the legs are usually more or less varicose, thus forming reservoirs of blood. The thyroid gland in the neck, the spleen, and all the blood-making organs increase in size and activity.

The *lungs* are pushed upward by the uterine tumor, but their capacity is increased, as the chest is actually broadened. The respiration becomes thoracic. If the uterus is overdistended, it pushes the abdominal organs up against the diaphragm, interferes with the action of this muscle, and thus causes great difficulty in breathing.

The Urine.—The total quantity of urine is increased. The specific gravity is often low. Sugar in traces is sometimes present, also albumin in traces, but these are always significant, and the patient requires close observation and a physician's care. The sugar is usually milk-sugar from the breasts. True diabetes is very serious. The kidneys and liver are the weak spots of the patient during pregnancy and deserve special attention.

The *skin* often turns darker, especially in brunets, and in all women, there is some pigmentation of the linea alba, the navel, and the nipples. The pigment is largely reabsorbed after delivery. Occasionally the face is almost covered with a brownish pigmentation resembling freckles closely run together—the so-called “mask of pregnancy.” (See Fig. 94, p. 220.) This likewise disappears nearly completely after labor. The sebaceous and sweat-glands are more active, and the active perspiration makes the patient more liable to colds. Lineae or striae gravidarum, the purplish lines described as occurring on the breasts, appear on the abdomen in larger number and sometimes on the thighs (Fig. 32). These striae are due to the stretching of the

skin, and are more common in some women than in others. Occasionally they are absent, though the woman has had several children.

The Digestive Tract.—The salivary secretion is increased, sometimes pathologically, so that there is constant dribbling of saliva. This latter is called *ptyalism* or *sialorrhea* or *salivation* and is similar to the excessive vomiting of



Fig. 32.—*Striae gravidarum*. This woman was toxemic, blood pressure 145. Note edema of face and hands.

pregnancy, with which it is frequently associated. The physician is to be informed of it.

The *teeth* in some women show a tendency to decay. This decay is due to the change in the secretions in the mouth, not, probably, to the child using up the lime salts of the body. There is an old saying, "every child a tooth," but it is not true. (For the Treatment, see p. 95.)

The patient is sometimes sick at the stomach in the morning—the so-called “morning sickness”—and this is one of the diagnostic points of pregnancy. Sometimes the patient craves all sorts of unusual things, which may be indigestible. One may humor these peculiar cravings if the article is not harmful. Occasionally these cravings evidence insanity, as in the case of a woman who craved a bite of her husband’s arm and actually took it. The wife of Camerius, a famous botanist of the sixteenth century, enjoyed herself during pregnancy by breaking eggs on her husband’s face.

Owing to the cramped position of the bowels, constipation is a common symptom, which grows worse as pregnancy advances and always requires treatment. (See p. 105.)

In the early months the gravida loses a little weight, but later more than makes it up, the gain varying from 10 to 25 pounds (including the baby). Sometimes the woman gets fat. Nature stores up albumin and fat during pregnancy to provide for the growth of the fetus, to supply energy during labor, and furnish materials for milk.

At birth 10 to 15 pounds (baby, liquor amnii, placenta, blood) are lost. In the puerperium, as we shall learn later, the patient gets thin, losing, in the lochia, sweat, etc., as much as 9 pounds, but much of this is made up during lactation.

The Nervous System.—Women are more sensitive and irritable during pregnancy, which may be due to functional disturbance of the ductless glands. Changes of disposition have also been observed. These phenomena are only evidence that the woman’s nervous system was not well poised and pregnancy has simply thrown it out of adjustment to her environment, as would any other physical or mental strain. Neuralgias, especially of the face and teeth, are common. One must exercise care in the extraction of teeth to relieve the pain, as healthy teeth may be needlessly sacrificed. Sometimes there is prickling of the

skin in the extremities, or a general itching which may resist treatment. It is thus seen how gestation tests the integrity of every structure in the body.

LABOR

Pregnancy begins with conception and ends with the expulsion of the fetus and secundines from the parturient canal. It lasts normally ten lunar months, forty weeks, two hundred and eighty days, though the time may be two weeks more or less. In some women the fetus develops quicker than in others, a child at eight months equaling the children of others at nine months. The process by which the fetus and secundines are expelled is called *labor*. The child is viable at the end of seven lunar months or twenty-eight weeks. If born at this time it is not strong and may live only a few hours. Should a woman go into labor and expel the product of conception before the child is viable—that is, capable of carrying on extra-uterine existence—we speak of abortion. *Abortion*, therefore, is the interruption of pregnancy before the end of the twenty-eighth week. The women call all premature interruptions of gestation “miscarriage”; the term “abortion” to them means a criminal process, and therefore, if one employs it, one should not fail to explain its scientific significance. Any interruption of pregnancy *after* viability of the child, but *before* two weeks before the expected time of labor, we call *premature labor*.

When labor is over the uterus immediately begins to return to its original size. This is called *involution*. At the same time a powerful stimulus is given to the breasts—*lactation* is established.

Labor may, therefore, be defined as that function by which the fetus and secundines are expelled through the natural passages, the retrogressive changes in the genitals started, and the secretion of milk inaugurated. There are three points to this definition. The cause of labor—what

influences the uterus which has carried its burden so long, suddenly and violently to expel it, is not known.

Labor does not usually come on without warning: there are *premonitory symptoms*. Usually the woman feels heavy and unwieldy in the last weeks, her gait is laborious, the bowels may become loose, urination more frequent, a free discharge of mucus from the genitals may be noted, and she has fleeting pains in the abdomen and elsewhere. There



Fig. 33.



Fig. 34.

Figs. 33 and 34.—Silhouettes of a woman before and after lightening occurs.

are three distinct signs that the time is nearing—lightening, false pains, and the show.

1. Lightening.—In the last two weeks, especially in primiparae, the child's head sinks into the pelvis and its body falls a little forward. The uterus sinks down and forward with the child. The waist-line lowers, the stomach region is flatter, the navel more prominent. The patient breathes easier, but walks less well. The head, entering the small pelvis, interferes with the bladder and frequent urination results. The rectum suffers also, and the bowels

are constipated. This phenomenon is called "lightening" or "dropping" by the people, and is sometimes attended with slight pains similar to labor-pains (Figs. 33 and 34). It is a good sign, indicating that there is no mechanical disproportion between the head and the pelvis—that is, that the head is not too large for the pelvis.

2. False Pains.—Sometimes, especially in multiparae, for a few days to three weeks before labor the patient is annoyed by pains in the abdomen. These often occur at night and pass off by morning; they are sometimes due to gas in the bowels, when they are relieved by castor oil or an enema. They are sometimes due to painful uterine contractions, which subside after a hot bath, a warm drink, and an enema. In rare cases an anodyne is needed. These false pains are annoying, as they may closely resemble actual labor and summon the physician and nurse unnecessarily.

3. The Show.—A few hours to twenty-four hours before labor really begins there is a discharge from the vagina of thick mucus, more or less stained with blood. This is called the show, and is the plug of mucus which fills the cervical canal during pregnancy. Sometimes the show is absent or appears after labor has been in progress for a while. If there is any pure blood with the show it is unusual, and the physician should be notified, as it may mean that the placenta is becoming detached (*abruptio placentae*), or that it lies over the os (*placenta praevia*).

The bag of waters may rupture as the first indication of approaching labor. This is undesirable, because the most favorable means of dilating the mouth of the uterus is thus lost. The patient then has what is known as a "dry labor," which is sometimes slow, tedious, and painful.

Labor is divided into three stages: The *first stage* extends from the time of beginning of the labor-pains to the complete dilation of the os uteri. It is called the period of dilatation. The bag of waters usually ruptures at the end of the first stage.

The *second stage* comprises the period from the time of complete dilatation of the cervix to the end of the expulsion of the child. It is called the period of expulsion.

The *third stage* extends from the time of expulsion of the child until the after-birth has been expelled, and the uterus has contracted down on itself. It is called the placental stage, and lasts twenty to forty-five minutes.

Labor varies in length. Sometimes it is completed in less than an hour, rarely it drags on several days. The average is eighteen hours for primiparae and twelve for multiparae—longer with the first baby because of rigidity of the soft parts. Most of the hours are used in the first stage, since in primiparae the second stage usually takes only two hours and in multiparae only thirty minutes or even less.

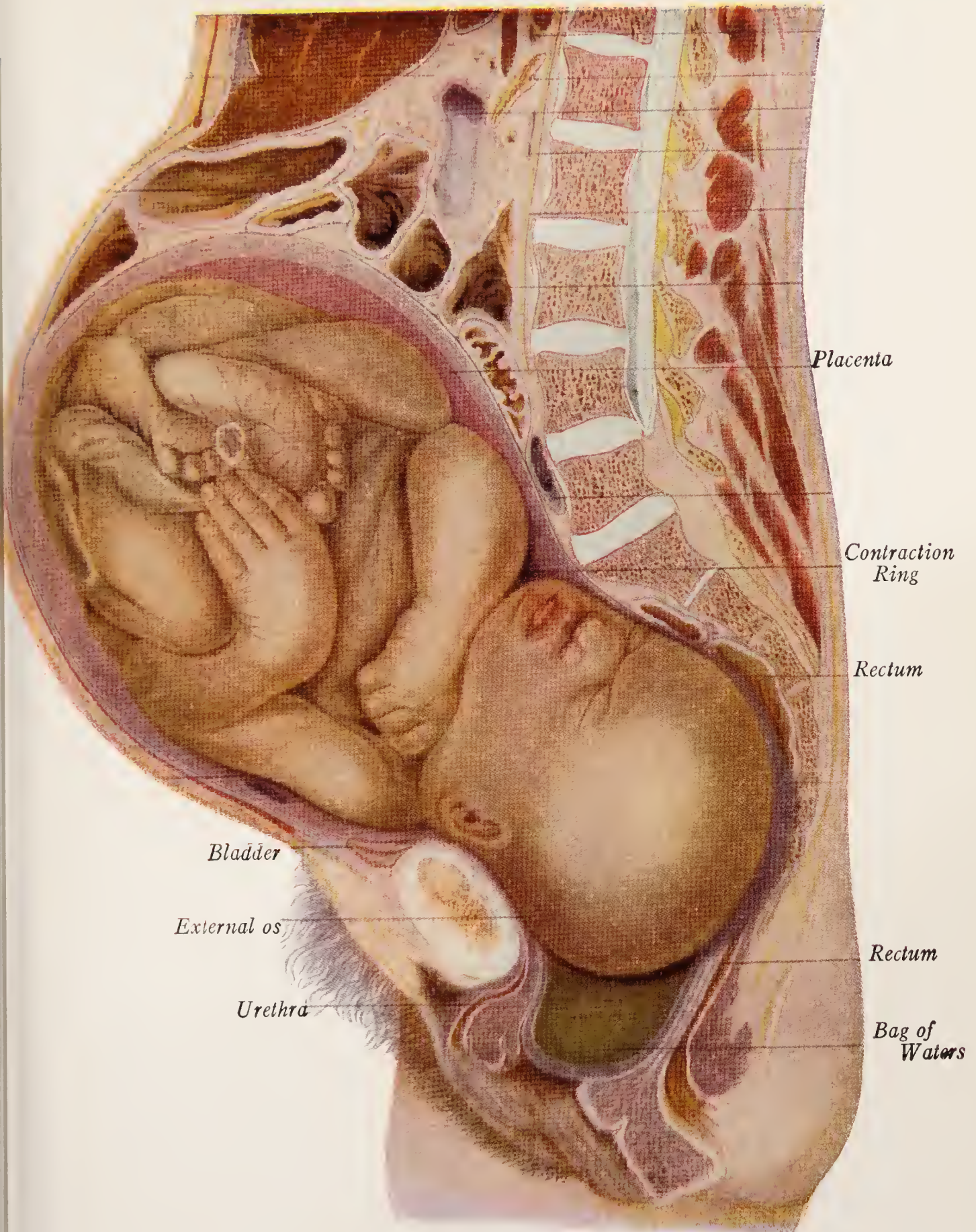
If one observes a labor critically, the process makes the impression of being a mechanical operation, consisting of the action of some expellent power on the fetus and placenta, forcing them through the maternal parts into the external world. Thus the factors of this mechanical operation are: the powers (the forces that prepare the way and drive the child, etc., along), the passages (the cervix, vagina, vulva), and the passengers (the child, placenta, etc.). The passengers—the child and the placenta—have been described on pp. 55–59. The passages, too—the pelvis, vagina, and vulva—have been described on pp. 25–32.

The powers remain to be studied. They are mainly two—the uterus, a hollow, strongly muscular organ, and the abdominal muscles. The uterus does all the work of the first stage. The abdominal muscles act during the second stage of labor as they do in procuring an evacuation of the bowels, that is, by bearing down or straining, and, with the uterine force, they complete the expulsion of the child. The combined force thus exhibited is sometimes enormous, and the patient may injure herself if it is not properly restrained. The uterus acts by rhythmic contractions called “pains.”

All three stages of labor are characterized by pains. These pains represent uterine contractions, and the two terms are used synonymously. Uterine contraction in all languages is expressed by the same word that means pain—for example, in German, *Wehen*; Italian, *dolores*; French, *douleurs*.

The Labor=pains.—The uterus contracts at irregular intervals throughout pregnancy, but there is no pain. Late in pregnancy there may be some pain, but usually when the uterine contractions become painful labor has begun, and this is our most reliable outward sign of the advent of labor. When the “pains” begin and become rhythmic we consider the woman in labor. If one observes the abdomen when a pain comes on—that is, when the uterus contracts—one feels the organ harden all over; it rises toward the ribs and stands out more prominently. With a strong pain the uterus becomes almost board-like in hardness. As the pain goes away the uterus softens and loses its sharp contour, and the abdomen flattens.

In the beginning of labor the pains are short, weak, and far apart, but as it progresses the strength and length increase and the intervals decrease gradually, being one hour, thirty minutes, fifteen, ten, six, five minutes, until, toward the very end, one pain follows almost immediately after the other. The nurse may judge the rapidity of the labor by the frequency, strength, and length of the pains. The parturient feels the pains at first in her back (the “kidney pains” of the French), and they are not so painful, but as labor goes on they are felt more to the front and are severer. The contractions last thirty and ninety seconds and between them the parturient is usually quite comfortable. When the woman is well on in the first stage she describes the pains as grinding, later as cutting, and in the second stage they are “bearing-down” pains. She makes more or less outcry, depending upon her ability to bear suffering. In the second stage she complains less, because,



Braune's frozen section of a woman who died at the end of the first stage of labor. The bag of waters at the vulvar outlet. The nurse should note the attitude of the child which is the usual one at the end of pregnancy and in labor.

although the anguish is great, she feels her efforts are helping the delivery.

The Bag of Waters.—The first effect of the uterine contraction is the formation of the “bag of waters.” That part of the fetal sac, or the membranes inclosing the child, which covers the internal os is forced into the os from within outward. The cervix being the point of least resistance in the uterus, when the uterus contracts it forces the liquor amnii in this direction. The os being covered by the membranes, these latter are forced out in the form of a pouch. This pouch is called the bag of waters, and it has important functions. First, it dilates the cervix and the vagina gently, evenly, and safely; second, it protects the baby from injurious pressure on any one part, because when the uterus contracts the force exerted presses equally in all directions, answering to the law of pressure on fluids; third, it prevents the cord from prolapsing; and fourth, if there is infection in the vagina, it prevents this from getting into the uterus or into the baby’s eyes. (See Plate II.) Some authors call the whole fetal sac the “bag of waters.”

The pains force the membranes like a fluid wedge down into the cervix, opening the internal os first (Figs. 69, *A*, *B*, *C*, *D*), then the external os, that is, “shortening” or “effacing the cervix,” then the external os is dilated until it is flush with the vagina, the parturient canal, a continuous passage being then fully formed (Plate II). As a rule the membranes now rupture, but they may not until later. If the baby is born with the membranes covering its head, it is said to be born with a “caul,” and it is considered a lucky omen.

When the uterus contracts, everything in it is squeezed out in the direction of the cervix. The child is forced against the os, and, when this is large enough, the head passes through it into the vagina.

The second stage has begun. The pains, aided now by the voluntary bearing-down efforts of the woman, drive the head along the vagina. The parturient takes a deep breath,



Fig. 35.—Head beginning to distend perineum. Note anus opens and shows anterior wall of rectum. When head is about ready to come through, episiotomy is done. The hand guides the head upward to relieve pressure on the distended pelvic floor. Follow action from above downward.

braces her feet in the bed, and pulls with her hands on a strap, a sheet, her husband's or the nurse's hands, grunting like a person lifting a heavy load. She may express a desire to go to stool or to urinate, symptoms due to pressure on the rectum or bladder.

The head rotates in the pelvis as it advances (see Figs. 7, 8, 36), and the occiput comes under the pubis. The perineum now begins to darken in color and to bulge outward, and the anus opens, so that the anterior rectal wall lies exposed. The pains are about two minutes apart and very strong. The vulva begins to open, and soon the

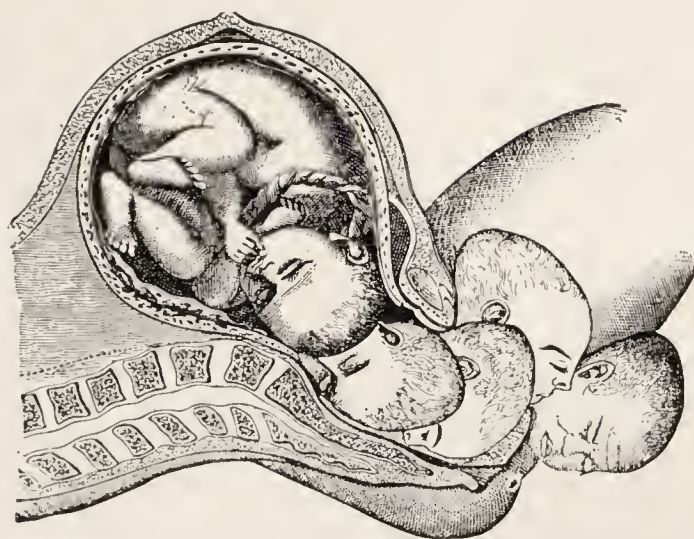


Fig. 36.—Diagram showing the advancement of the head through the pelvis (Leishman).

wrinkled scalp is visible (Fig. 36). Under the action of the pains and strong pressing efforts of the mother, which are not involuntary, the vulva is dilated so as to allow the passage of the child. Sometimes the parts will not dilate, but tear, or the doctor has to incise the perineum to permit the escape of the child. This operation is called *episiotomy*. After the head is delivered the face turns to one side. This is due to the untwisting of the baby's neck and the movement conveyed to the head by the baby's shoulders rotating inside the pelvis. It is called external restitution. Now there is a short pause, after which the shoulders come, followed at once by the trunk. The child gives a sneeze

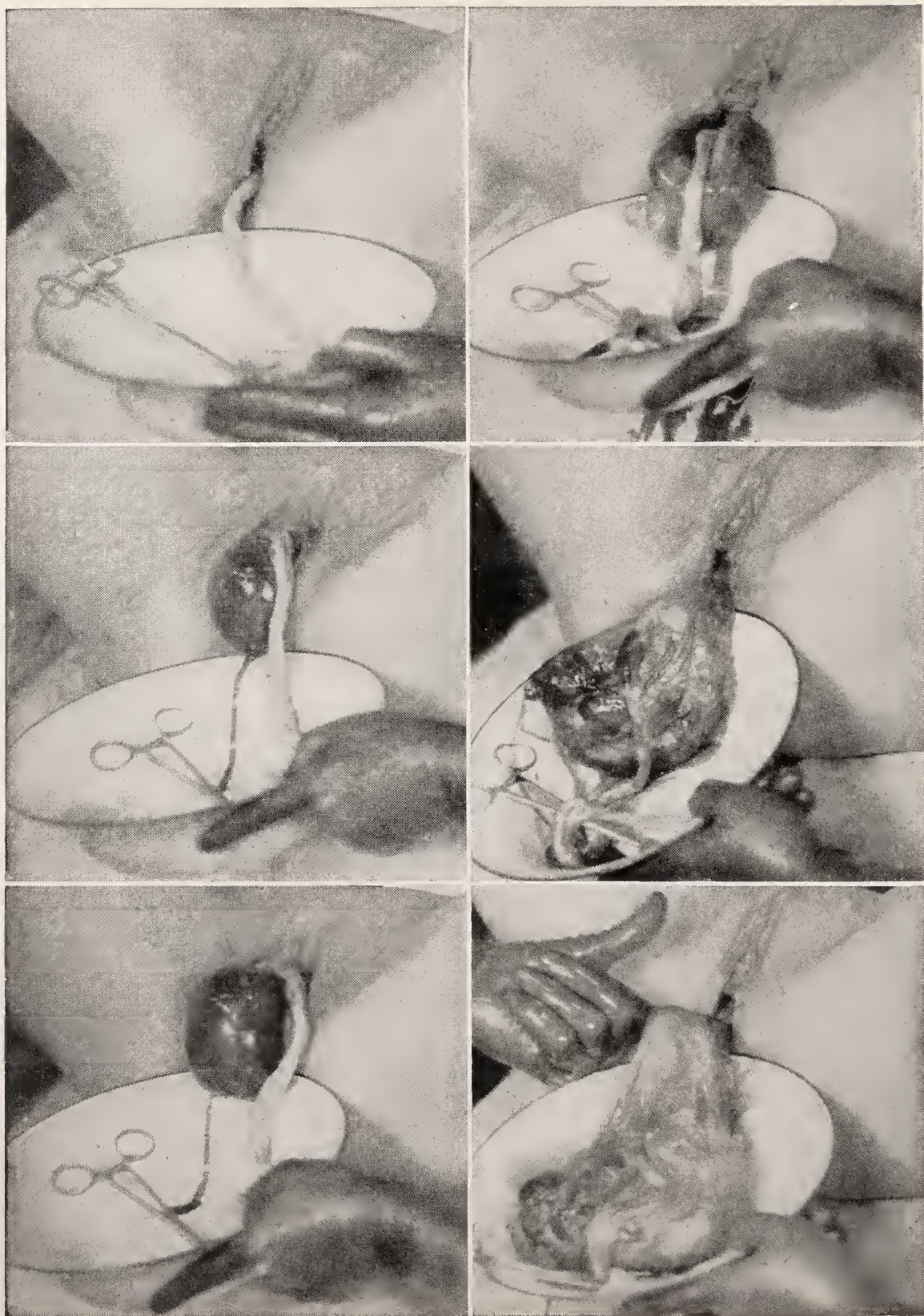


Fig. 37.—Delivery of the placenta. Scenes from a moving picture. Note how nurse holds basin in the first scene. The basin was tilted only to show the delivery. Follow the action from above downward. At the last the finger gently lifts the membranes out.

or a gasp, and soon cries lustily. Now come blood, liquor amnii, sometimes meconium, and the ends of the membranes.

The pains cease and the patient feels much relieved.

The second stage is ended; the third stage begins. The patient is tired and may fall asleep, especially if an anesthetic has been used. After a short interval, during which the uterus may be felt as a roundish body the size of a cocoanut, lying under the navel, the pains recommence—the after-birth pains, recurring every three to four minutes. The placenta is squeezed off the surface of the uterus by the contractions and expelled into the vagina. Sometimes there is a little hemorrhage with each pain. Soon the cord slides down a little from the vulva and the patient bears down, or the doctor presses on the uterus and the after-birth appears (Fig. 37). It usually turns inside out as it appears (Schultze's mechanism), but sometimes it comes folded together with the edge first (Duncan's mechanism). The nurse receives it in a sterile basin, or the physician takes it, gently pulling on the membranes, which strip off slowly from the uterus. There is always more or less blood when the placenta comes, and a little more follows it. The open vessels at the placental site are bleeding and continue to do so until the uterus contracts and constricts them. The constricting fibers of the uterus have been called "living ligatures." The uterus now is felt as a hard ball behind the pubis, and the third stage of labor is ended. The *puerperium* is now begun—the woman is a *puerpera*.

THE PUERPERIUM

The puerperium is characterized by the return of the genital organs to their previous condition and the development of the breasts for the function of lactation, that is to carry still further the function of reproduction. Retrogressive changes occur in the genitalia; progressive changes in the breasts.

Involution.—The *uterus*, which after labor is the size of a small cocoanut and weighs about 2 pounds, by a process of fatty degeneration and absorption quickly diminishes in volume. The nurse can follow this astonishingly rapid reduction in size by feeling the fundus of the uterus and

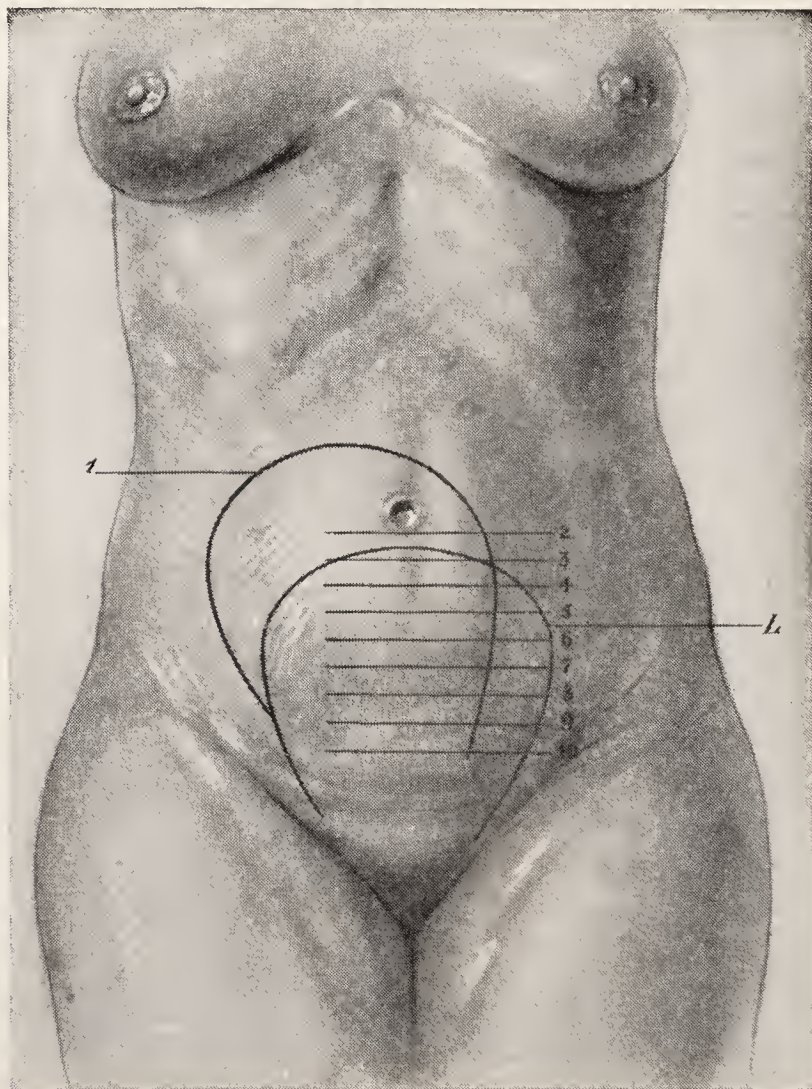


Fig. 38.—Height of uterus postpartum, the bladder empty: *L*, After labor; 1, first day; 2, second day, etc.

measuring from its top to the pubis. On the first day the uterus is high—even above the navel; on the third day it is eight fingerbreadths above the pubis; on the fifth day, six fingerbreadths. On the twelfth day it is at the pubis, and after this normally cannot be felt through the abdomen (Fig. 38). If the bladder or the rectum is full the uterus is pushed up higher (Fig. 39). The nurse will also notice

that the uterus continues to contract and relax during the first week. These are after-pains and, in multiparae, whose uteri are naturally flabby, may be very painful for one to three days. In primiparae the uterus is firm unless there is a clot or a bit of membrane in it, and they seldom have after-pains.



Fig. 39.—Uterus pushed up by full bladder.

The Lochia.—The lining membrane of the uterus, the endometrium, is cast off and renewed during the puerperium. This is attended by a flow of fluid from the genitals called the lochia. The lochia varies in appearance and consistence from day to day, and varies in different women, also with the kind of labor the patient has had.

On the first day the lochia is bloody—*lochia cruenta*. Sometimes there are clots. If these are large, the case is abnormal. Note the expulsion of all clots, membrane, etc., on the history sheet, and save anything abnormal for the doctor's inspection, either fresh, wrapped in a wet cloth, or in 50 per cent alcohol. On the second and third days the lochia is still bloody, but there is quite an admixture of serum. It is called *lochia sanguinolenta*, or is said to be serosanguineous. For a few days now the lochia is creamy

and reddish. After the sixth day there is quite an admixture of fatty detritus and pus-corpuscles, which make the discharge purulent—*lochia purulenta*. Later in the puerperium there is only a watery clear discharge—*lochia serosa*. Sometimes the bloody lochia persists for several weeks. Microscopically, about the third day, the lochia contains red and white blood-corpuscles, epithelium from the genital tract, bits of necrotic or dead endometrium, or *decidua*, and millions of microbes. These germs are not virulent unless the puerpera is septic or unless they are introduced into conditions favorable to their growth. Thus the lochia of one puerpera might, if introduced into the vagina, infect another puerpera. Nurses have infected their fingers by the lochia of normal puerperae, and that infection may be carried from here to the breasts is generally admitted.

The amount of lochial discharge varies from day to day and in different women. It varies also according to the nature of the labor and the conduct of the third stage. Women who menstruate freely have profuse lochia; operative cases excepting cesarean section have much for the first few days; when the uterus has been thoroughly emptied at a labor the discharge is scanty. The lochia may be pent up in the uterus and give rise to fever.

The odor of the lochia changes during the continuance of the flow, being at first blood-like; later it resembles that characteristic of the patient. A foul or putrid odor is always indicative of infection, though the infection may not be serious. (See chapter on Puerperal Infection.)

The vulva and the vagina after labor are dark, bruised, and more or less torn and abraded. There is, usually in primiparae, more or less swelling. This edema is quickly absorbed, also the ecchymoses. The pelvic structures and abdominal wall soon recover their former tone, though seldom completely. All these processes are grouped together and called "involution." Involution, then, may be defined as that group of processes occurring when the

uterus and other genital organs return to their usual conditions. The health of the woman depends on the involution proceeding undisturbed, wherefore the nurse should know and observe the phenomena and report to the physician all abnormalities. A firm uterus, rapidly diminishing in size and normal lochia are best evidences of proper involution. Menstruation sometimes begins six or eight weeks postpartum. A nursing woman may become pregnant, contrary to the popular notion.

The **breasts** take on their greatest activity during the puerperium. Whereas the processes going on in the pelvic genitalia are retrogressive, bringing those structures back to their previous condition, the changes occurring in the breasts are progressive—designed to further carry on the function of reproduction.

On the first day the infant obtains the secretion known as colostrum. This is rather indigestible and produces catharsis. Even of the colostrum there is very little the first day, so that the infant practically starves, but the colostrum is needed, as it possesses immune bodies which help the child ward off infections. On the second day there is more secretion in the breasts, and it is quite yellow from the admixture of butter-fat. On the second day in multiparae, on the third in primiparae, there is usually a rush of blood and lymph into the breasts. They are swollen, enlarged, turgid with blood, painful and tender, and feel hot. The patient, when the engorgement is marked, may be in much distress. The breasts are sometimes so large and hard that the nipple is flattened and the baby cannot grasp it for nursing. Since the breasts are thus not emptied, the engorgement is not relieved. This condition is popularly thought to be a rush of milk to the breasts, but it is nothing but an acute engorgement of the organs. No milk is formed, but it is ready to be formed, and needs only the stimulation of nursing. Should the child not nurse the engorgement would gradually subside. If it nurses the

milk is made, and mostly during the nursing itself. In multiparae, and after lactation is established, the breasts having formed the habit of making milk at certain periods, do so, and thus there comes to be a little milk in the breasts; but this is not the rule, nor is the quantity large, and herein lies the fallacy of pumping the breasts continually to relieve them. It is not overfilling with milk that is giving the trouble, but lymphatic and venous engorgement, and measures for relief should be directed toward these. Under appropriate treatment the engorgement subsides spontaneously in a day or so, and the function of lactation is gradually established. (For Treatment, see p. 420.)

The engorgement of the breasts is not accompanied by fever. There is no such thing as "milk-fever," When there is fever about the time that lactation is being established its cause must be sought elsewhere, and some form of sepsis will usually be found.

GENERAL CHANGES IN THE PUERPERIUM

The general condition of the woman during the lying-in period is different in some respects from that of other women. The temperature is sometimes a little higher than normal. It may rise to 99.5 F. and not be pathologic, though the writer is accustomed to regard every rise above 99 F. with suspicion. Anything above 100 F. is certainly indicative of disease.

The pulse ought to be below 88. If higher, there is usually something wrong, as hemorrhage, infection, heart disease, etc. Sometimes a woman has naturally a rapid heart and in rare cases it is remarkably slow.

The *loss of weight* during the first two weeks may vary from 9 to 15 pounds. This is due to the increased excretion of urine, of sweat, the wasting of the uterus (2 pounds), the lochia, estimated from 1 to 3 pints, decreased food intake, and the loss through the milk. The women look lean and washed out when they first get up. Nowadays we

allow the puerpera a more liberal diet and the weight is usually made up by the fifth or sixth week, even when the mother nurses her baby.

Kidneys.—The patient passes much urine during this time—*polyuria*—therefore the nurse should see that the bladder is not overfilled, because it may cause hemorrhage from the uterus and cystitis. When the bladder is overfilled it makes a soft tumor above the pubis (see Fig. 39), pushing the uterus up and to one side. Retention of the urine after labor is common. If the bladder overflows, this condition is called *ischuria paradoxa*. The inability to urinate is due to several causes: first, the horizontal position in bed, some patients finding it impossible to urinate lying down; second to the bruising and swelling of the urethra caused by the labor; third, the abdominal walls are weak from over stretching during pregnancy. In hysteric women and after some operations the amount of urine may reach from 3 to 5 quarts.

Bowels.—Constipation is the rule because the patient is quiet on her back, and because the abdominal muscles are stretched and the intestines inactive from being in a cramped position so long. Not seldom there is tympanites. In pathologic cases this may require special treatment. Rarely it is fatal.

The **skin** is active, the patient sweats freely, and therefore is more subject to chilling—an important hint. There is, too, a peculiar and somewhat characteristic odor about the patient. This may be altered by disease, as uremia or sepsis.

The **mental condition** is altered, the patient being more susceptible to nervous influences; her mind is making adjustments to her new state in the family and society, and to the awakening sense of responsibility to her child; therefore the general desire to keep parturient women free from all worry and excitement. In Roman times a criminal was safe if he took refuge in the house of a puerpera, and

even the tax-gatherer was debarred. It is claimed by some that a puerperal woman is so sensitive to nervous shock that such may cause an acute rise of temperature. The writer has seen a few instances where the fever could not well be explained on any other grounds, but such a diagnosis is hard to prove.

If the nurse will pause here and envisage the function of reproduction as a whole, reviewing the phenomena she has learned to know—the development of the child from the tiny ovum to the beautifully formed creature she has placed in the mother's arms; the changes in the genitalia and the general system, the first designed for the necessities of the growing fetus and the others to adapt the physique of the mother to the demands of pregnancy; the mighty cataclysm of labor, the wonderful mechanism by which the product of conception is brought into the world; the puerperal processes, those regressive changes whereby the organs are restored to their natural states; if the nurse will recall these phenomena she will, with the author, stand in awe and reverence before this miracle of nature. When to this feeling there is added a broad and deep sympathy for the mother and babe in whom this miracle is being enacted, and who suffer pain and sometimes loss of life, there surges a desire to be helpful and to do our part in the work of carrying them through the ordeal to health and happiness.

CHAPTER IV

THE NEWBORN INFANT

THE BABY IN THE FIRST WEEKS

AT no period during the life of the individual does he undergo such violent and fundamental changes as at birth and during the two weeks after it. Not a few children fail to survive the shock of delivery, and a great many succumb in the first month because of their inability to meet and overcome the adverse conditions of existence.

The physiologic changes occurring in the newborn child as it adjusts itself to the new environment will form a peculiarly interesting study for the nurse, because he is entrusted to her in the early weeks of his life. His present health and future welfare depend so much on the care she gives him. While nature has endowed him with all the functions of life, digestion, respiration, urination, circulation, etc., and with general and special immunities against disease, still, the nurse must remember these are all yet in the developmental stage and, further, that the baby has passed through a trying and exhausting ordeal and suffers a drastic change of environment. Inside the uterus, an even temperature, water, ideally adapted foods, protection from shocks, injury, and, to a large extent, the attacks of microbes, are all his portion. Introduced into the world, he meets rigorous conditions to which he must quickly conform. To him the food question and the onslaughts of microbes are of greatest importance and it is in providing proper food, and in protecting him from infection, that the nurse will be able to render him the most service.

If the nurse will observe the child right after it is born, she will see tiny respiratory movements of the chest; then

comes a gasp or a sneeze which clears the air-passages; then a short cry; finally, the lusty crying. These few moments are crucial. The change from the uterine circulation of the blood to the extra-uterine is now taking place. The lungs are expanding; the heart now pumps the blood directly into the lungs and through the body as in the grown-up. The foramen ovale in the partition between the two sides of the heart begins to close. Should the lungs not expand fully, sufficient air cannot enter and the child remains blue, and if the condition is marked, it will die after a period of from two to forty-eight hours. During this time each breath drawn by the infant is marked by an expiratory grunt or whining cry. It is pitiful to hear, and soon the infant becomes unconscious and finally comatose. This condition is called *atelectasis pulmonum*, and is much more common in premature infants. The respiration of even a healthy infant is irregular, and for a few hours the child may be a little bluish around the mouth and nose, with cyanotic hands and feet, but this disappears fully, being replaced by the healthy pink or red.

The **cry of a newborn infant** is lusty at first, then the infant quiets and cries only when hungry, uncomfortable, disturbed, or sick. A whining cry is suggestive of atelectasis, prematurity, and illness; a sharp, high-pitched cry, of cerebral trouble; a sharp, loud cry with kicking of the legs, of hunger or colic; a fretful cry, with borborygmus (rumbling in the bowels) and greenish stools, of indigestion.

Sleep.—The newborn infant sleeps nearly all the time when it is not disturbed. After a week, but sometimes sooner, it usually begins to show signs of intelligence. It moves in its sleep, and occasionally muscular jerks may be seen, due to a jar or sudden light. If the child does not sleep, something is wrong.

The **temperature** varies normally from 98 to 99 F., usually it is 98.4 F. In premature infants the temperature is 97 to 98.6 F. or lower if they are not kept warm. The

normal pulse-rate is from 120 to 140 a minute. The respirations are 38 to 44 a minute. The pulse is made more rapid by the least disturbance. It is difficult to count and is felt best in the temple and while the child sleeps.

The **skin** is at first bluish pink, becoming in a few hours pink or red. At birth it is more or less covered with a white, thick cheesy material, the *vernix caseosa*, which is composed of epithelial cells, lanugo, and sebaceous secretion accumulated on the skin during intra-uterine life. During the first days the skin dries and may crack in the folds; it may desquamate in more or less large flakes. In some babies—less than half—there is a yellowish color to the skin after the third day, the so-called *icterus neonatorum*, or jaundice of the newborn. Its exact nature is not known. If the jaundice is slight the general health of the baby is not affected, and the skin clears in a few days; but if the child is deeply jaundiced the condition may indicate a serious disease. These cases are slow to lose the yellow color. The children remain for a long time weak, small, and puny.

The Navel.—The umbilical cord is tied and cut off $\frac{1}{2}$ to 1 inch from the skin margin. The stump of the cord in a few days shrivels up to a thin, tough strand. At the edge of the skin, where the cord has been inserted, a line of granulation forms which separates the stump of the cord. The cord usually drops off from the fifth to the fifteenth day; it may be sooner or later than this. The process is one of aseptic necrosis, the wound healing by granulation and cicatrization. Careful asepsis must be observed in the treatment of the stump, that infection may not interfere with the process.

The Baby's Bowels.—For the first three days the infant passes a thick, dark green, tarry material, called *meconium*. This has been accumulating in the bowel since the fetus was very small, as it is found in the intestine of fetuses expelled in the early months of pregnancy. When the child is from three to five days old the movements are brownish

in color, and then gradually there is an admixture of yellow from the food. By the sixth day usually the green has entirely disappeared and the movements are pure yellow.

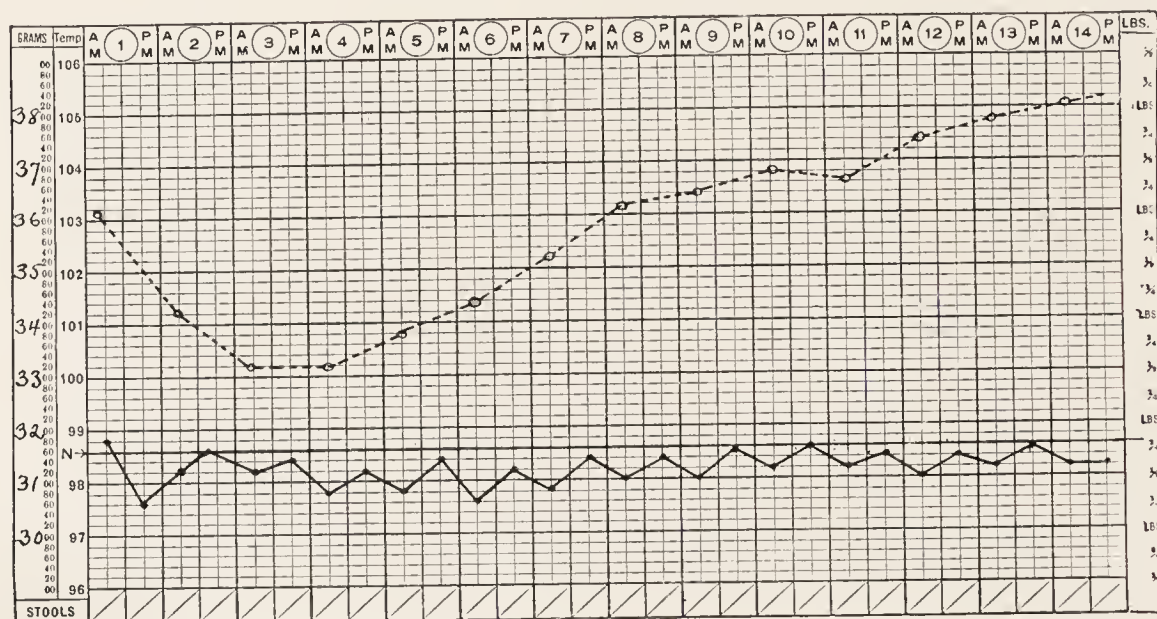


Fig. 40.—Weight (dotted line) and temperature chart of healthy newborn infant.

This is the normal process. The green may persist longer in some cases. The odor of a healthy baby's stools is not bad, resembling somewhat that of sour milk, and the color should be golden yellow. There should be no mucus in them, and the water-line outside the solid part of the bowel movement should not be more than $\frac{1}{2}$ inch wide. Greenish, frothy, slimy, foul-smelling, acrid stools betoken intestinal disease. A continuance of the brown color shows insufficient food.

The Kidneys.—The newborn infant generally passes urine in the first few hours. This must be watched for, and if absent the parts must be inspected for evidence of obstruction. Sometimes the napkin is stained with a reddish, brick-dust-like deposit, the so-called uric acid. In the kidneys of children dying in the first days this same deposit is frequently found. The urine in these cases is too concentrated and requires dilution, which is accomplished by the free administration of liquids, especially water.

The Weight.—The infant loses weight during the first four to eight days, and then begins to regain it. By the eleventh day it again weighs as much as when born. Children vary much in this regard, depending on their constitution and on the food they get. Large babies lose more, and also those delivered by hard operations. If breast fed, and the supply is abundant, the initial loss may be small, and the birth weight may be regained before the fifth day (Fig. 40). Under contrary conditions the child may weigh less in three weeks than it did when born. This is especially true of premature infants, as they lose relatively more—sometimes a quarter—of their whole weight. They regain it slowly, often remaining stationary for weeks before the little body begins to grow.

Contemporary with the initial loss of weight there is sometimes a rise in temperature. Pediatricians disagree as to its cause, it may be starvation or infection.

Girls sometimes have a little whitish discharge from the vagina, and rarely they menstruate. This lasts one to five days and is not of serious moment. Occasionally it is too profuse, when a drop of extract of ergot, three times daily, may be needed.

CHAPTER V

THE HYGIENE OF PREGNANCY

THE sphere of the nurse is widening every year. Among the many fields for her activities, that of the care of the pregnant woman, is getting to be one of the most important. The nurse comes into more intimate relationships with her patient than does the doctor. She is thus better informed of the deeper currents of the woman's life by sympathetic listening, which encourages the voluntary disclosure of the troubles in her mind, and she can often discover psychic influences which are hidden from the physician, but which may have a serious effect on her charge's mental and physical health. A knowledge of psychology will help the nurse immensely in studying the mental conflicts and the maladjustments to her environment of her patient, and by apprising the physician of the facts her helpfulness in the treatment is increased. For a fuller consideration of this aspect of the nurse's duties she is referred to an excellent book on the subject, *Psychology for Nurses*, by Mary F. Porter, A. B., R. N., and to that of Aileen C. Higgins, A. B., R. N., *Nursing Psychology*; also William James, *Minor Psychology*.

This same intimacy will enable the nurse to more successfully apply the principles of prenatal care to the mentality and the particular conditions in which her patient lives, and it renders her especially useful as a spreader of health knowledge. Indeed, nurses make excellent public health officers, as they appreciate the importance of details and they know how to get them carried out.

These, and other qualities, make the nurse very valuable in the care of pregnant women, and many physicians are now calling upon her for such service. She is in demand,

not so much in the practice of obstetric specialists, who watch the pregnant women themselves, as in organized prenatal and infant welfare clinics, public health services, life insurance work, city and rural district, visiting nursing, and in the offices of busy general practitioners or surgeons, who are more than willing to turn over to her the routine of blood-pressure readings, urinalyses, the instructions in the hygiene of pregnancy, the watchfulness for untoward symptoms, the discussion of the infant's layette, etc.

In this chapter, therefore, we will discuss first the hygiene of pregnancy, those matters on which the nurse will be asked many questions, and her advice often sought, and second, prenatal care, those services which she must be able to render either directly to the patient, or as assistant to the physician.

MODE OF LIVING FOR THE PREGNANT WOMAN

Dress.—The dress of a pregnant woman should be simple and warm. There should be no heavy skirts. There must be no circular constriction at any part of the body, which means that round garters, corsets, tight skirt-bands, etc., must not be worn. Closed drawers are essential. All skirts should hang from the shoulders, from a waist or by means of suspenders. The secret of proper abdominal dress for pregnant women is that there should be no pressure on the womb from above downward, but the uterus should rather be supported from below. It is sincerely to be desired that women will not go back to tight corsets again. Such constriction produced pelvic congestion and weakening of the abdominal wall and also interfered with the baby's freedom of motion, even its growth. Deformities, such as club-foot, may thus be caused. On this account the writer recommends all pregnant women to go without abdominal constriction as much as possible, and also, in the latter months, every day, to very gently knead the abdomen and the child's body so as to relieve the latter from

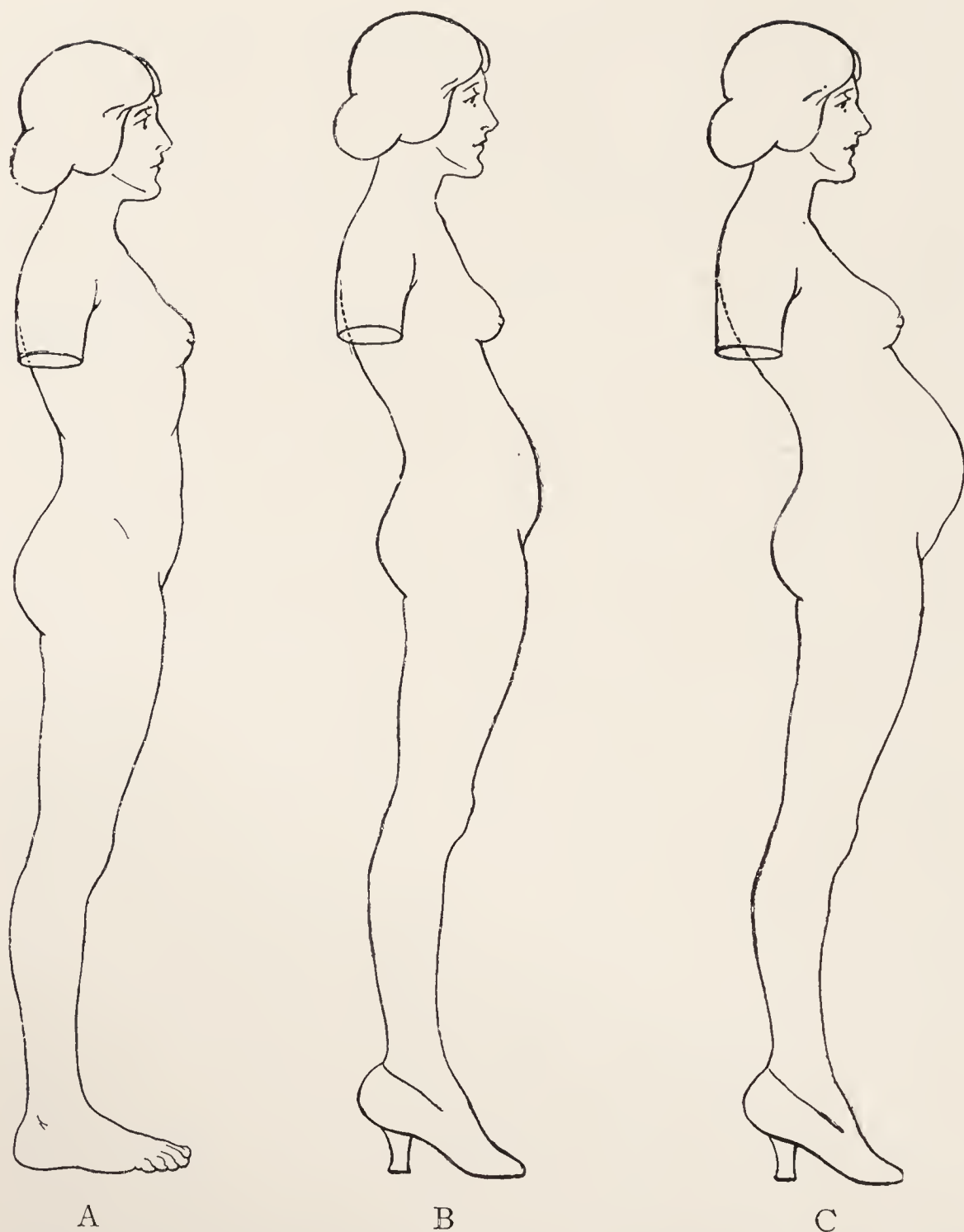


Fig. 41.—A, The first figure shows a normal healthy non-pregnant woman. Note easy curve in back. B, The second figure is the same woman with high heeled shoes. Note sharp curve in small of back, protuberant abdomen, tendency to flat chest. C, The third figure shows the pregnant woman with all the above exaggerated. Should one wonder she has pain in her back, drawing pain on her ribs, an ungainly figure, and awkward and precarious gait?

any constrained position into which it may have been forced.

The ordinary corset is to be discarded after the third month, and a short maternity waist and brassiere substituted. In the latter half of pregnancy most women, and especially multiparae with flabby abdominal muscles and pendulous belly, will obtain much comfort from a well-fitting abdominal supporter such as is worn after laparotomy. This helps the abdominal wall to carry the weight of the child. (See Fig. 160.) Several corsets or waists especially designed for pregnant women are on the market. The principle of the properly fitting corset is not to hide the pregnancy, and procure a beautiful figure, as so many believe the object to be, but to so support the abdomen from below that the abdominal muscles are relieved of excessive strain. At the same time there should be no compression above the navel, but the space here left open for the upward growth of the uterus.

Should the breasts grow large and distress the patient by their weight, care should be taken that sufficient support be given. This is as much needed to avoid injury of the delicate organs as to insure comfort.

The pregnant woman should wear low-heeled shoes—the so-called common-sense shoe with broad toes. High-heeled shoes render walking insecure and are distinctly injurious, causing pain in the back and bearing-down sensations in the abdomen. A glance at the figure of a pregnant woman will show how this comes about. Owing to the development of the abdominal tumor, which tends to pull the trunk forward, the woman throws her shoulders back and straightens her neck. This balances the figure, but it makes a sharp angle in the small of the back. It gives the gravida a peculiar pose and gait which did not escape the eye of Shakespeare, who called it the “pride of pregnancy.” Now if, in addition, the pregnant woman wears high heels, the trunk is pushed still further forward, and to save herself from falling the gravida throws her head and shoulders very far back, making a sharper bend in the lumbar region. This causes pain here and overstretches

the abdominal wall in front. The effort to keep erect is also fatiguing. It is sad to contemplate how the beautiful female form is distorted at the behest of fashion, but it is sadder to think of the physical misery and injury to health these behests cause. (See Fig. 41.)

Preservation of the Figure.—Naturally and properly, women are desirous that the function of child-bearing should not leave the person in an ungainly shape, for example, with protuberant abdomen. The most common complaint is that the patient develops a “high stomach” after labor.

It may be remembered that the Roman women had abortions performed so that they need not suffer the disfigurement produced by child-bearing. Certain changes in the body are the necessary results of childbirth and beautify the figure, although some women do not look at it in this light. Such are the general rounding of the hips, broadening of the bust, the more mature and matronly appearance. It is natural for some women to put on fat after delivery, and nothing done before, during, or after confinement will prevent it. An excessive accumulation is, however, amenable to the usual treatment for obesity. Antifat medicines should not be taken during pregnancy, and never without the physician's order.

For the prevention of “high stomach” or extreme prominence of the lower abdomen much may be done. The condition is caused by weakness of the abdominal muscles, or even by a separation of the recti muscles, when the woman is said to have a “rupture.” As the result of either, the intestines fill with gas and fall forward; sometimes the kidneys become movable, or even the liver prolapses. The muscles give way under the stretching produced by the growing uterus, and, of course, will give way sooner if there are twins or an unusually large child, or if the abdominal walls are weak. If corsets are worn during pregnancy, they add to the strain on the lower abdomen and thus favor muscular weakness. High-heeled shoes are another factor. Overstraining during labor and inattention to the bowels

after labor are also causative. To prevent the muscular insufficiency, one must begin with the girl. She should develop herself as does the boy, with active sports—rowing, swimming, climbing, etc. When a young woman, she should not “lace” and thus paralyze the abdomen. Healthy exercise of the whole body should form part of her daily routine. The abdomen may need some support during the last three months of pregnancy, which may be obtained by one of the maternity corsets recommended. A special abdominal binder may sometimes be needed, and this in multiparae with already weakened walls or with twins, polyhydramnios, etc. After the birth of the child the nurse should see that the bowels are regularly emptied and that gas does not accumulate in the intestines. The binder after labor does not prevent “high stomach,” and while the writer recommends it (see *Treatment of the Puerperium*), the most benefit obtained from it is when the patient first leaves the bed. To bring the abdominal walls back to their original tonus the nurse may, after the uterus has shrunk into the pelvis, give them a daily five-minute massage.

To prevent the overstretching of the skin and the formation of the lineae or striae gravidarum, our efforts are not very successful, but the writer recommends albolene as an inunction. Several such remedies are much vaunted in newspaper advertisements. Massage of the skin with oil or fat does help prevent striae.

Women whose legs become swollen and full of immense varicose veins should wear rubber stockings. This, in its marked form, is a congenital defect and unpreventable.

The Diet.—The diet of the pregnant woman should be simple, but not strict. The amount of meat and broths should be small—meat once a day only. Starches fried in fat and rich pastry should be avoided. Otherwise a liberal diet may be allowed, especially plenty of water, milk, and all the milk-products. Cereals, fruits, and vegetables should be eaten, especially fruit, to loosen the bowels.

Women sometimes reduce the food taken in the last three months with the idea of restraining the growth of the child. This, if overdone, is unwise. Certain books advise a special diet to reduce the bone salts in the skeleton of the fetus and thus insure an easy labor. It is questionable if the desired effect could be obtained without first injuring the mother, and, further, the child would probably suffer from rickets. In women with contracted pelves a specially restricted diet has been tried with a view to restraining the development of the child and thus insuring its passage; the results are not certain. (See p. 590.) On the other hand, the gravida, thinking she must feed two persons, must not overeat. She should be advised to continue her usual habits during pregnancy, to carefully guard against indigestion by eating only those things she knows agree with her, and to be sure to include in her diet those foods which supply protective substances, so-called *vitamins*, and calcium. In addition to the fats, carbohydrates, proteins, and mineral salts in ordinary foods vitamins are necessary to build up and maintain the whole system in a state of health and resistance to disease, and to give the child a strong constitution. The lime is needed to supply the growing fetal skeleton. Foods containing vitamins, phosphates, iron, and calcium are milk, butter, eggs, fresh leafy vegetables (lettuce, cabbage, tomatoes), peas, beans, carrots, and fresh fruits, especially the citrous varieties. In goitrous districts provision for iodine is made, the equivalent of $\frac{1}{4}$ grain each week, either iodized salt or KI, on doctor's order.

No wine or other alcoholics may be taken, first, because of the danger, exaggerated during pregnancy, of contracting the liquor habit; second, because of the demonstrable bad effect on the offspring. The evil effects of alcoholics on the infant were recognized even in biblical times. Samson's mother was commanded to abstain from wine during her pregnancy. A child conceived while the father is intoxicated may be dull, stupid, or diseased. Diogenes was aware of this fact, which recent experiments on guinea-pigs

have proved. In the first half of pregnancy the fluid intake should be increased; in late pregnancy, especially if edema is present, it is slightly reduced.

SUGGESTIONS FOR A DIETARY IN PREGNANCY

During the **first three months**, the period when the pregnant woman is likely to show the milder symptoms of toxemia—anorexia, nausea, vomiting, weakness, etc.—food taken every three or four hours but in small amounts and containing a preponderance of sugars and starches will be most easily borne and will help correct the toxemia. The following few suggestions may be helpful in planning the meals for the first trimester of pregnancy.

Before Arising: Two crackers, or slice of toast.

Glass of milk or weak hot coffee with cream and sugar.

Breakfast: Orange, apple, dish of stewed prunes or apricots.

One egg, or one small chop, or two slices of crisp bacon.

Two slices of toast with butter, or one shredded wheat biscuit or oatmeal with cream.

Cup of cocoa, or postum, or glass of fresh milk.

At 10 o'Clock: Three oatmeal crackers, or nabisco wafers.

Glass of milk.

Lunch: One cup of cream of asparagus or celery.

Two salt soup crackers.

Lettuce, tomato, endive, chicory salad with sugar and a dash of lemon or sweet vinegar—no spices.

Two thin slices whole wheat bread, or toastedryebread.

One pattie of fresh butter—preferably unsalted— $1 \times 1 \times \frac{1}{4}$ inch.

Two tablespoons of ice-cream, or custard, or floating island.

Tea: One cup of chocolate, or tea with lemon and sugar.

One piece of simple cake, $3 \times 2 \times 1$, or crackers.

Dinner: One cup of bouillon, or vegetable soup.

Two salt soup wafers.

A small lamb chop, or equivalent of steak, or veal, well done.

Two tablespoonfuls mashed potato, or carrots.

Two thin slices of old bread, or toast, or soda crackers.

One pattie of butter, $1 \times 1 \times \frac{1}{4}$ inch.

Fresh salad, tomato, or lettuce, or endive, without spicy dressing.

Sweet dessert, lemon-ice, blanc-mange, ice-cream, $\frac{1}{2}$ cup.

At Night: Glass of hot or cold malted milk.
Two or three oatmeal crackers.

During the **second trimester** the stomach is more settled and larger meals with less frequency may be advised.

Breakfast: One orange, or one-half grape-fruit, or stewed prunes.
Oatmeal or other cereal and cream, rice with honey.
One egg with two slices of crisp bacon.
Two slices of toast, or corn muffin or roll.
One pattie fresh unsalted butter.
Cup of cocoa, weak coffee, or postum, with sugar and cream.

At 10 o'Clock: A glass of milk.

Lunch: Cream of celery or tomato soup, or oyster stew.
Two salt sticks.
One scrambled egg with strawberry preserve.
Lettuce, tomato, endive, etc., salad, sugar and lemon dressing.
Two slices of old bread, or toast, or crackers.
One pattie of butter.

Tea: Dessert—blanc-mange, ice-cream, custard, $\frac{1}{2}$ cupful.
One glass of chocolate malted milk, or tea with lemon and sugar.

One American or cream cheese sandwich, 3 x 3 x $\frac{1}{2}$ inches.

Dinner: Plate of vegetable soup (little spice) or cream of corn or celery.

Two salt wafers.

One small lamb chop, or equivalent of fish (preferably salt-water), or steak, well done.

Mashed or baked potato, or carrots, or spinach, $\frac{1}{2}$ cupful.

Salad—lettuce, tomato, cabbage, endive, with sugar, lemon, and oil.

Dessert—jelly roll, ice-cream, fruit ice, $\frac{1}{2}$ cupful.

Plain cheese with hard cracker.

At Night: Glass of hot malted milk.
Two oatmeal crackers.

During the **last three months** of pregnancy the demands of the fetus for food, for lime, phosphorus, and iron are greatest, and the mother's diet should supply them, else the child will draw on her reserves. For example, Dr. Widdows has shown that from the

seventh month on the fetus utilizes about 10 grains of calcium (lime) every day. There is usually enough calcium in a general diet, but it may be guaranteed by the woman eating lime-bearing foods—oatmeal, milk, cheese, yolk of egg, etc. Sunlight has been found to promote the calcium and phosphorus metabolism. Cod-liver oil (rich in vitamin A) acts like sunlight and in certain cases of undernourishment may be added to the diet. As was already stated an insufficient diet with the object to reduce the size of the fetus and to prevent adiposity is not recommended. It is possible that rachitis and endocrinal diseases of the child are due to improper nourishment of the mother in pregnancy.

Breakfast: One orange or apple, or one-half grape-fruit, or stewed prunes.

One saucer oatmeal, or other cereal with cream, or rice and honey.

One soft-boiled egg with two slices of crisp bacon.

Two slices of toast, one corn or graham muffin, with butter and syrup.

One cup of cocoa, or milk, or weak coffee.

At 10 o'Clock: Fresh fruit, or fruit juice drink.

Lunch: Cream of asparagus, of celery, or vegetable soup (no spice), or oyster stew.

Plain wafers (unsalted).

One small chop, or one egg, in any fashion.

Salad made with yolk of egg dressing, or sugar, lemon and oil.

Two thin slices buttered bread, toast, or oatmeal crackers.

Weak tea, or cocoa, or glass of milk.

Tea: Hot malted milk, or milk.

Cheese sandwich.

Dinner: Plate of soup (unspiced and with little salt).

Plain wafers.

Baked potato, crushed carrots, or spinach, or beet tops.

Fish, or meat, 3 x 2 x $\frac{1}{2}$ inches, plain sauce.

Salad—lettuce, cabbage, etc., no spiced dressing.

Dessert—ice-cream, plain layer cake, custard, fruit sherbet.

Cheese and Bent's hard crackers.

Nuts (unsalted, well masticated).

The nurse is now aware that the general metabolism of the pregnant woman is in a state of unstable equilibrium.

Among the many factors which easily upset it are the foods she eats. Thus we often observe in the pregnant woman the symptoms of food allergy, or sensitization to certain articles of diet. The manifestations of this condition may be intestinal or general: *intestinal*—in the form of dyspepsia, heart-burn, flatulence, nausea, vomiting, diarrhea, abdominal pain; *general*—in the form of urticaria (hives), rhinorrhea, asthma, rheumatic arthritis, low blood-pressure, headache, etc.

The physician will study each case and try to find out to which particular food the patient is sensitized, and will arrange a suitable diet.

We do not know what upsets the metabolism in the toxicoses, but we do know that their manifestations may be partly controlled by diet. If there is a tendency to acidosis (reduced alkalinity of the blood) the doctor will order a diet containing a large amount of alkaline base, such as vegetables (particularly potatoes), nuts, sweet milk, and fruit (especially apples, muskmelon, and oranges).

Recent experiments on rats have shown that lack of certain vital principles in the food intake may cause sterility, or compromise the growth of the fetuses in utero, resulting in abortion or the production of puny litters which die early. These investigations show how important it is for the nurse to insist on a wholesome, varied, well-balanced dietary for the pregnant and nursing woman.

Exercise.—A moderate amount of exercise must be taken each day, but the patient should always stop short of fatigue. A woman cannot develop muscle during pregnancy to make labor easier; she should have done this before. If active exercise tires her too much, a general massage may be given, always avoiding the breasts, the abdomen, and the veins. Walking in the open air and in the sunlight must be urged, always, of course, short of fatigue. Physiologists tell us that exercise, especially out of doors, increases the circulation and respiration, aids digestion and elimination,

strengthens the nerves, promotes sleep, and improves the general metabolism, even stimulating the red bone-marrow and other blood-forming organs. Direct sunlight on the body is a powerful tonic. No golf, tennis, dancing, or swimming is permissible during pregnancy. Sewing on the machine should be restricted. A motor is desirable.

The patient may go to the theatre, but must avoid crowds for fear of getting into a crush. She must avoid gatherings in close rooms, especially with stove-heat, because of the danger of coal-gas, etc., injuring the child. She should not travel much, and if travel is necessary, should go in the most comfortable way obtainable. If a patient has a history of abortions or a known tendency, travel should be prohibited. Long trolley rides may bring on premature labor, and the same may be said of automobile riding on rough roads.

The importance of fresh air cannot be exaggerated. At least two hours should be spent in the open each day, and all day and night there must be free ventilation in the living rooms.

The Mind During Pregnancy.—The pregnant woman should lead a placid, quiet life, avoiding mental as well as physical fatigue and excitement. She should read good books and avoid medical subjects. It is not necessary for her to be acquainted with the processes of labor and its various complications. From medical books published for the laity she will obtain erroneous impressions regarding the function, and groundless fears will be engendered in her mind.

The patient must not be allowed to worry over her condition and her approaching labor. So far as possible she should be removed from association with gossiping neighbors, who take pleasure in recounting the difficulties and dangers of parturition, and the relation of wonderful cases—and the nurse must not be guilty of the same offense. On the contrary, she should always hold before the patient the

expectation of a normal and easy delivery, and should establish in her supreme confidence in the physician, herself, and the art of obstetrics.

The advent of pregnancy stirs the emotions of a woman very deeply, and if, in her early life, she has not learned how to adjust herself to new conditions we may expect at this time many symptoms of mental and nervous imbalance. For this reason the mind during pregnancy has been a favorite study for psychologists and psychoanalysts, and much has been written about "repressed desires," "mechanisms," "conflicts," "complexes," etc. Without doubt the laws of the mind have been elucidated by these studies and we have discovered the cause of many psychoses through them. For example, a pregnant woman vomits and the physician learns that she does not want the baby because her husband is unkind to her. The vomiting is the result of a repressed conflict between the maternal instinct and the desire not to please her husband. Many simple mental and temperamental disturbances, such as irritability, moodiness, outbursts of temper, petulancy, refusal to nurse the newborn—indeed, in those who are predisposed by heredity or weak constitution, even major psychoses, paranoid states, hysteria, nervous breakdown, etc., may be explained by maladjustment to environment or the repressed fears of the mother for herself or her baby.

Most women are sure they are going to die in labor, but may be ashamed to confess it. Many dread the ordeal as one of great pain and of physical injury resulting in invalidism or retain a frightful memory of a previous unfortunate delivery. Some fear they will lose their beauty and therefore their attractiveness to the husband. Not a few are selfish and look upon the child as an interloper who will tie them to the home and curtail their social activities or interrupt a "career." Sometimes a mother is jealous of the baby because he may supplant her in her husband's affections—at least she may have to share them. A woman may repudiate motherhood because it conflicts with her "will-to-power." Others fear the impoverishment caused by one more mouth to feed or are afraid to assume the responsibilities of rearing children. Finally may be mentioned the rare cases of women in whom pregnancy creates a terror, as indefinable as it is ineradicable, similar to that some people have of lightning and thunder.

Many mothers worry about the baby. It may be a monstrosity because she has seen something ugly; it may inherit insanity or disease from its forbears; it may have been injured by the medicines she took early in pregnancy to produce an abortion; the family means may

not be enough to provide it with a good education; she may not wish to rear it in the religion of her husband, and finally—though there are many more—the mother may not wish to introduce children into a warring, chaotic, and selfish world.

The nurse, in her intimate confidences with her patient, is in a peculiarly happy position to be helpful to her; first, by cordial, sympathetic listening as she unburdens her mind; second, by explaining the fears away on the grounds of scientific knowledge, and third, by kindly advice. Furthermore, she should consult the physician, who will guide her in the treatment of the mind of her charge.

Maternal Impressions.—There is a popular notion, handed down from the ages, that a woman's condition of mind may influence her unborn child mentally and physically.

Statistics tend to prove that the mothers of great men nearly always were characterized by great intelligence, superior intellectual attainments, or religious devotion, and that great-minded fathers less often procreated children that became great. The evil effects of alcoholism during pregnancy have already been alluded to.

Most physicians do not believe that the state of the mother's mind during pregnancy can affect the fetus. They base this disbelief on the fact, which cannot be doubted, that there exists no connection, either nervous or vascular, between the child and its mother. That a fright or shock can so alter the milk of a nursing mother that the nursling may be seized with convulsions is a fact. Reasoning from analogy, one would believe that the same effect could be produced on the child in the uterus. A fright or shock may bring on abortion or premature labor causing a hemorrhage in the placenta.

If a woman believes that by reading good books her child will be intellectual; that by studying good pictures and sculpture her child will be artistic; that by engaging in the science of mechanics her child will be mechanical, the belief may be encouraged, as it conduces to the general welfare

of both, even though there is no scientific basis for the belief.

That a fright, such as seeing an ugly object or deformity, will produce a like deformity in the unborn child is not scientifically proved. Cases reported in evidence of such effect can usually be explained by coincidence, if untruthfulness be excluded. The fetus is completely formed at the eighth week, and the shock or impression to which the deformity is usually ascribed almost always occurs after this time.

The limits of this book do not permit the presentation of the many theories and reasons for and against the proposition, but suffice it to say that the nurse may comfort the mother with the statement that maternal impressions do not affect the physical well-being of the child.

The Determination of Sex.—Even if it were possible, it is doubtful if it would be desirable that parents be able to influence the sex of the unborn child. We do not know what causes produce the two sexes in the ratio of 105 males to 100 females, a ratio that obtains the world over.

Many investigators have studied the subject and endless theories have been propounded, but nature still hides the secret of the production of sex. As far as we know at present, the sex of the child is already determined in the ova in the ovaries of the girl, even before puberty, and, therefore, no external influences can affect the sex of the infant during pregnancy. It is a matter of chance whether a male or a female ovum is the one to be fertilized by the male element.

To predict whether a male or a female child will be born is also beyond our ken. All statements in this regard, it must be admitted, are guesses. The rapidity of the fetal heart-tones may be used as a basis of the guess. If the child's heart beats faster than 140 a minute, we say a girl will be born; if below 130, a boy, leaving the intervening numbers as of doubtful significance. It seems, also, that a

child conceived just about the time of the menses is more likely to be a boy.

The Bowels.—Attention to the intestinal tract during pregnancy is of the utmost importance because toxins are eliminated through the bowels, thus sparing the kidneys. Most women—perhaps 9 out of 10—are costive during pregnancy, and the relief of chronic constipation requires great effort, patience, and persistence. A long-standing habit cannot be cured during pregnancy, and usually we must resort to medicines, but they are always avoided if possible. The general rules for curing constipation are the same during pregnancy as out of it, and are as follows:

1. Have the patient make it an unfailing habit to go to stool at a certain hour each day. Usually the best time is shortly after breakfast. Should no movement occur at the time—and straining is not permitted—the action of the rectum may be provoked by a glycerin suppository or an enema. As the habit is established, these means are omitted. She must never resist the desire to go to stool at any time.

2. Every morning, just after rising, and every evening, just before retiring, the patient should drink a glass of cool water and eat some fruit—two apples or oranges or a large dish of apple sauce, also plenty of water between meals.



Fig. 42.—Tin funnel with rectal tube for oil enemata.

3. Her diet should contain fruit and vegetables in abundance, especially spinach, peas, beans, barley, tomatoes, oatmeal, corn, and foods of this kind. No tea is allowed, but a little coffee may be taken at breakfast.

4. Every night before retiring let the patient inject into the rectum 6 to 8 ounces of common olive oil by means of a hard-rubber syringe and catheter (Figs. 42, 43). The oil remains overnight in the rectum, soothes the mucosa, and allays a possible spasm of the bowel. In the morning the bowels will move or may be aided by a plain water enema.

If these rules prove insufficient, let the patient eat prunes, figs, and dates, warning her to chew them very thoroughly. It is good that the patient have some system about this, for

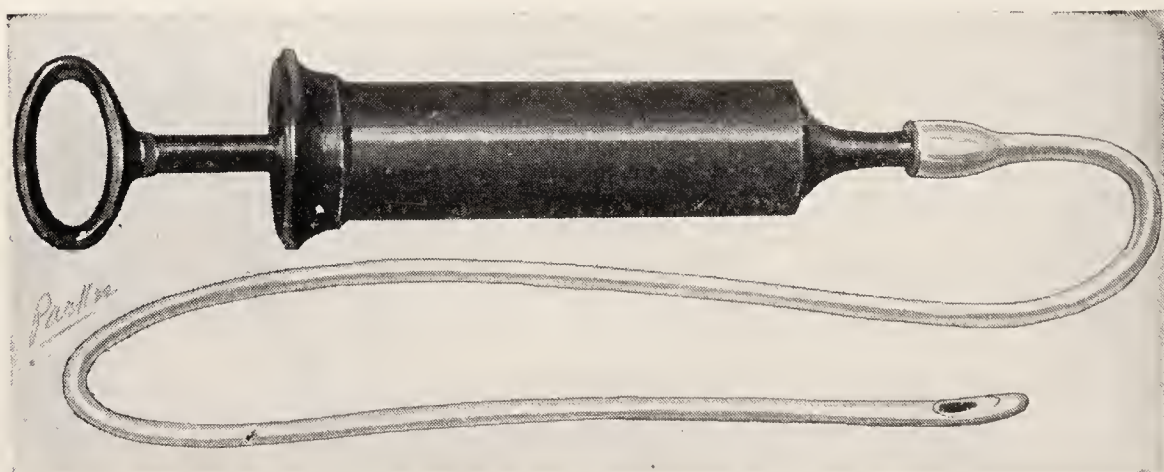


Fig. 43.—Hard-rubber syringe and soft-rubber rectal tube (small) for oil enemata.

example, that she begin eating five prunes the first day, increasing one each day up to fifteen, then decreasing to five, then up again. There is a little mental suggestion in this, indeed, the mind has much to do in perpetuating the constipated habit, and often by convincing the patient that the bowels will move voluntarily (psychotherapy) the condition may be cured. If the patient is not pregnant, abdominal massage may be practiced, and the results are usually good.

If constipation persists, we resort to drugs, and, of them all, fluidextract of cascara sagrada (*Rhamnus purshiana*) is

the best. Alternate, after a month's use, with Pluto water or other saline laxative and phenolphthalein, all, of course, with the physician's order. Enemata are useful only for temporary relief, not for daily and continuous employment, because they dilate and weaken the bowel and may irritate it. The cascara should be given in increasing doses, like the prunes, increasing 1 drop each day up to 30 drops, then decreasing. The bitter extract is the best, administered in capsules; 5-grain empty capsules are filled with the medicine in proper dosage just before it is taken. A tablespoonful of milk of magnesia A. M. and P. M. is laxative and antacid. Latterly much use is being made of liquid petrolatum, with or without agar, a tablespoonful night and morning. It is an intestinal lubricant.

The Kidneys.—These organs are generally conceded to be the weak spot during pregnancy, and, therefore, they require particular watching and care. The urine should be examined every three weeks during pregnancy, and oftener if there is any reason to suspect trouble. The test should be made for albumin, sugar, specific gravity, the amount of urea, and microscopically for casts, etc. The total amount passed in twenty-four hours is of utmost importance—it should be at least 50 ounces. If there are casts or albumin, the case is usually one of nephritis, or should be considered such, and danger apprehended. The physician should also be notified if not enough urine is passed. Edema of the feet and swelling of the hands and eyelids are always significant, though they need not come from kidney disease, and should be reported to the physician.

Toxemia.—There is a condition found during pregnancy due to improper functioning of internal organs or insufficient elimination from the organs of excretion; it is called toxemia, and produces symptoms from the stomach, as hyperemesis gravidarum or excessive vomiting; symptoms from the brain, as eclampsia, persistent headache, etc. The patient should take care of her kidneys, and follow the rules laid

down under Dress, Diet, Bathing, and Bowels, which have the health of these organs in view. (See chapter on Complications.)

Bathing.—The skin during pregnancy is more active than usual and requires more care: first, to avoid chilling; second, to keep up its function as an excretory organ. There is an Oriental proverb, “A man should have one good sweat each day.” Bathing stimulates the sweat and fat glands of the skin and removes waste matter secreted by them, thus promoting health and obviating a source of objectionable odor.

The patient should bathe daily or often during the week. The bath should be tepid—88 to 90 F. Cold bathing, cold plunges, cold showers, sitz-baths, ocean bathing, and hot baths are all proscribed during pregnancy. Abortion has repeatedly been caused by surf bathing.

In the month before labor and during labor the tub-bath had better not be employed, because of the danger of the wash-water gaining entrance into the vagina and introducing infective matter. The shower-bath must be substituted. This advice is especially needed for multiparae with patulous vulvae.

For the sometimes profuse perspiration a tepid bath followed by a vigorous rub with a “salt towel” is efficacious. A salt towel is made by wringing a coarse bath towel out of a strong salt solution and drying it.

Care of the Genitals.—Since the secretions from the genitals are augmented—leukorrhea being a common complaint—daily ablutions of the parts are essential to keep them free from eczematous eruptions and to avoid odor.

Multiparae, especially, because of the patency of the introitus, may contract infections of the vulva and vagina from street dust and by contact with dirty water-closet seats. The patient is instructed to wear closed drawers, certainly in the later months of pregnancy, and she should

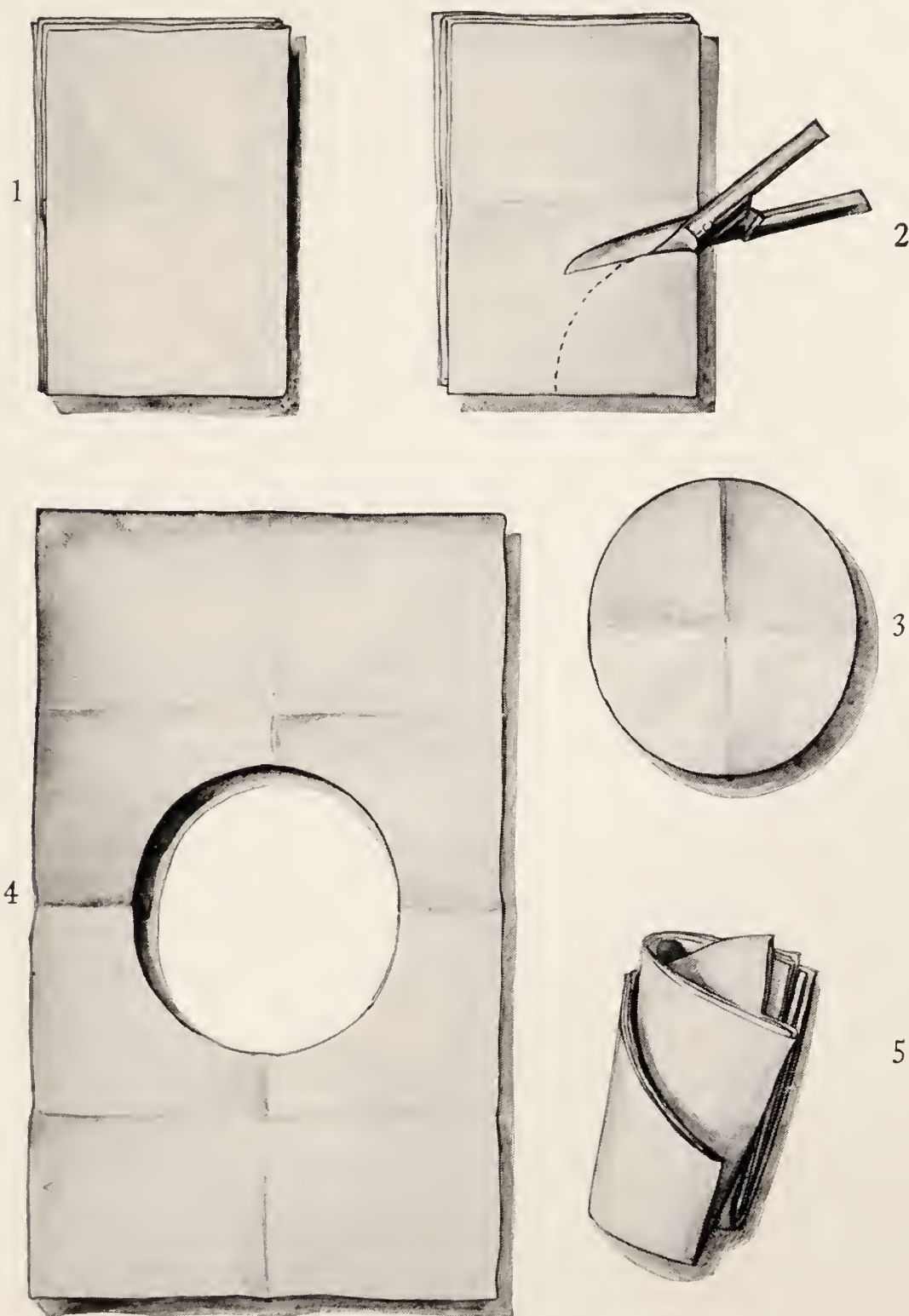


Fig. 44.—Sanitary seat cover. Take a piece of tissue paper, 15 x 20 inches, fold as in 1, cut as in 2. The center (3) is laid on the water in the closet bowl to prevent splashing; the large piece (4) covers the seat. After use it is cast into the bowl. Several, folded like 5, should be carried while traveling. These are now purchasable.

provide herself with sanitary seat covers for use when away from home (Fig. 44).

If the vulva is enlarged by varicose veins, the woman must be instructed to avoid injury which might cause a fatal hemorrhage.

Care of the Breasts.—The breasts require care from early girlhood to fit them for the important function of lactation. It is a great misfortune if a woman cannot nurse her infant, and no effort should be spared to prevent such a calamity. From the time of puberty the growing organs should be protected from pressure, so that the whole gland may develop properly. At all times and especially during athletic exercises care should be taken to avoid injury. Mothers should be taught to provide for the development of the reproductive organs of their girls as well as for the development of their brains.

During pregnancy, if the breasts are large and heavy, some form of supporter should be used. The surface should be washed daily with soap and warm water, using care to remove the branny scales from the nipples, and then the latter anointed with cocoa-butter or cold cream. In blondes with very tender skin the following lotion may be applied to the nipples each morning for a week, to be followed by the use of albolene or cocoa-butter for a week:

R.	Glycerite of tannin.....	$\frac{1}{4}$ ounce
	Compound spirit of lavender.....	1 “
	Water.....	3 ounces

No strongly astringent washes or alcohol should be used; the nipples must not be hardened, but rather kept soft and pliable. The nipples should be relieved of all compression. If they are flat, gentle attempts to draw them out may be made night and morning. The breasts should at all times be protected from injury, which some time later might become the starting-point of a mastitis.

The Engagement of the Nurse.—The author believes that obstetric nursing requires higher skill than any other form of nursing, comprising, as it does, surgical, medical, and infant nursing. It is more arduous, certainly. For

these reasons only the best nurses should adopt this specialty, and the author contends the remuneration should be higher than for work in the other branches of the profession. An obstetric nurse should not take infectious cases. She should allow sufficient time between engagements. It is better for the nurse to be at the house a few days or a week before the day of labor, but most women prefer to wait until labor has begun before sending for the nurse, which is a very uncomfortable way, since this keeps the nurse waiting at her home and she may not be accessible when wanted. Occasionally an arrangement is made whereby the nurse remains at her home for a stated time before the labor, being paid by agreement half or full salary. It is wise to have such agreements made in writing, though it is not customary. The time a nurse is called depends, of course, upon the time set for confinement, and since this can never be determined accurately, the nurse seldom knows when she will be summoned. A certain date is usually agreed upon from which time the nurse awaits a call. The nurse may take short, clean cases up to this date, or, if they promise to run over the day of her obstetric engagement, with the stipulation that she will be allowed to leave when the call comes.

PRENATAL CARE

"Prenatal care" is a term much in vogue and means the medical supervision and care of the pregnant woman and her unborn child up to the time of delivery. The term "prenatal" rightly applies only to the baby, but usage includes the care of the mother also.

The necessity for prenatal care has only of late been emphasized as it deserves. It is one of the notes struck by the author in the opening words of the Introduction to this book. Over 23,000 women die during childbirth in the United States every year. Millions of women are more or less permanently invalided by childbirth and over 200,000 children are born dead or die in the first few weeks of their existence. A certain portion of all this misery is, because of our present meager

knowledge, inevitable, but we know enough to prevent a large part of it, as has been amply proved by the experience of the Metropolitan Life Insurance Company, the Maternity Center Association of New York, and the numerous maternity hospitals and visiting nursing associations conducting prenatal clinics. We do not need to bring statistical proof of it.

The objects of prenatal care are to so conduct the mother and baby through pregnancy that both are healthy and strong at the end, and ready for the ordeal of labor, with the assurance of a successful delivery, a living child, and a prompt recovery of the mother, while the new individual is given a good start toward healthy citizenship. Although emancipated woman plays many parts in our modern social order, still is her most important function the perpetuation of the race, and everything in her life is to be ordered with this purpose in view so as to fit her mentally as well as physically for its performance.

It is necessary for the nurse to appreciate how comprehensive prenatal care is. It begins before the girl baby is born, extends through infancy, childhood, puberty, marriage (includes even the husband); it is particularly thorough during pregnancy up to the time of delivery of the finished product of conception.

Obviously we cannot go into the subject in as great detail as its importance deserves. Lack of space forbids; further, much belongs in province of the physician and much the nurse must learn in text-books on gynecology, diseases of children, etc. A few scattered examples may be given. A woman is treated for syphilis before her baby is born to prevent transmission of the disease. A nurse is careful not to squeeze the breasts of a young infant because sometimes an abscess results and the grown woman may have no breast tissue for nursing. The nurse must know how to feed an infant to prevent rickets. Rickets cause contracted pelvis and this causes dystocia (difficult labor).

Freud has shown that impressions on a child's mind may persist in the form of repressed fears which may be the root cause of psychoses later in life. Especially at the time of puberty does the growing girl suffer physical, mental, and emotional strain. The nurse may be helpful to her by explaining the phenomena of the period and regulating her life to meet its demands. The mother, too, may require advice regarding the menstrual irregularities of the daughter, all of which the physician will either give or aid the nurse in giving. The body as well as the mind must be prepared for the function of child-bearing.

The nurse's advice may be sought regarding the requirements of a eugenic marriage, and she may be able to give the bride enlightenment on matters of sex which will carry her safely through the ordeal

of the first days. A modest, sensitive young woman may thus be spared a serious mental shock which might estrange her from her husband or engender an inner conflict of repugnance which might lead to hysteria or other neurosis. But it is mainly during pregnancy that her services will be in constant demand, and she will apply the principles of prenatal care to the varying conditions she meets, following the routine prescribed by the physician with whom she works.

The duties of the nurse may comprise more or less of the following:

1. Assistance at the first general physical examination of the gravida and at subsequent routines.
2. Teaching the hygiene of pregnancy.
3. Studied supervision to prevent diseases and accidents.
4. Treatment, by the nurse, of the minor complications and discomforts of pregnancy.
5. Preparations for the approaching labor, at home or the hospital.
6. Advice regarding the infant's layette.

The First Visit.—The physician usually obtains a complete medical and obstetric history and makes a *thorough physical examination* of the patient at her first visit. This includes the diagnosis of pregnancy, pelvic measurements, taking the blood-pressure, the temperature, the weight, frequently the Wassermann test for syphilis, and blood-count and hemoglobin estimation, sometimes smears from vaginal mucus for the search for the gonorrhea germ and the spirochete of syphilis, or the trichomonas, and always a urinalysis.

If the nurse is to fill out the antepartum record, besides obtaining general information of previous diseases (tuberculosis, heart disease, nephritis, etc.), accidents, operations, special predispositions (tendency to hemorrhage, mental imbalance, adiposity, etc.), she should inquire particularly into the family history of obstetric accidents (convulsions, hemorrhage), and the nature of previous pregnancies, labors, and puerperiums, eliciting whenever possible the exact cause of the dystocia and, if the babies

died, the reason. If the nurse is tactful in her questioning she may learn of the existence of venereal disease in either wife or husband, which may have important bearing on the conduct of the case.

Diagnosis of Pregnancy.—This is not always easy, even late in pregnancy, and in the early months may not be made positively even by an expert accoucheur. The nurse has the following points on which to base a diagnosis of pregnancy:

1. *The Cessation of the Menses in a Healthy Woman.*—If a woman in good health ceases to menstruate during the period of reproductive life, the probability is very strong that pregnancy exists.

2. *The Morning Sickness.*—If a woman apparently healthy is affected with morning nausea and vomiting, there is a presumption of pregnancy, but no more than a presumption. Together with the absence of the menses the symptom has more value.

3. *Enlargement of the Breasts and the Areolar Signs.*—Shooting pains in the breasts, prominence of the nipples, puffiness of the areola, pigmentation, and colostrum may be noticed. These evidences are very strong, but not certain, because nervous women may show them at their menstrual periods.

4. *Quickening or "Feeling Life."*—Since this is a subjective sign—that is, felt by the woman—it has no positive value. Even matrons have imagined feeling a child in the abdomen when none was there. A mother of nine children prepared a complete outfit for the tenth, which she imagined she felt. One patient of the author felt labor-pains when she was not even pregnant. Quickening occurs during the sixteenth to the eighteenth week.

5. *Palpation of the Fetus, of Fetal Movements, Hearing the Fetal Heart-tones, and the x-Ray Picture.*—These are the only positive signs of pregnancy, but may rarely be elicited before the fourth month.

Progressive enlargement of the abdomen, protrusion of the navel, frequent urination, leukorrhea, general pigmentation, are all unreliable signs of pregnancy. The physician has more means of diagnosis, *e. g.*, the bluish discoloration of the vagina and vulva (Chadwick's sign); softening of the cervix (Goodell's sign); compressibility of the lower uterine segment (Hegar's sign); intermittent uterine contractions (Braxton-Hicks' sign). By the aid of these an early diagnosis may usually be made and practical certainty has recently been attained by a new test.

6. *The Aschheim-Zondek Test.*—The urine of pregnant women (as early as three weeks) contains an excess of anterior pituitary hormone. If we inject this urine into immature female mice or virgin rabbits the ovaries enlarge and even hemorrhages occur in the follicles.

Diagnosis of Time of Confinement.—One can never predict the date of labor exactly. An error of two weeks either way is always possible, because we do not know when the gestation begins or when it ends. The time of conception is not known, labor is more or less accidental, being sometimes brought on by external causes, and the length of pregnancy varies in different women, and in the same woman at different times. Therefore all statements as to the exact time that labor will occur are conjectural. Experience, however, has shown that we can arrive at an approximate date, which, for practice, is fairly satisfactory, if not wholly so.

1. Count back three months from the first day of the last normal menstruation and add seven days. For example, Mrs. X menstruated last beginning October 10th: July 17th is set for confinement.

2. Count twenty-two weeks from the day of quickening for a primipara, and twenty-four weeks for a multipara.

3. Count two hundred and seventy-three days from the supposed date of impregnation.

4. Count two weeks from the time of lightening. This is very unreliable.

5. The physician will measure the fetus by means of the pelvimeter and the cephalometer, and by general palpation

of its body, and, judging from its size and consistence, will say that the child is about thus and thus far along in development. Outside of the error due to uncertain human judgment there are other fallacies, because some children at eight months are larger than others at term and even those carried over time. The *x*-ray may help.

The height of the fundus, the girth, the size of the uterine tumor are all unreliable, since they vary with the amount of liquor amnii, the fat in the abdominal wall, with twins, a full bladder, etc.



Fig. 45.—Taking the blood-pressure.

Pelvic Measurements.—The value of the external pelvic measurements as an index of the size of the pelvic cavity is not held to be very great by most accoucheurs, and the nurse is only rarely required to take them. A short description is given in the Appendix page 557. The physician, however, by internal pelvic mensuration and palpation, will have determined whether or not the patient has a pelvis so contracted as to interfere with labor.

Taking the Blood-pressure.—This is a very necessary item of prenatal care, because elevation of the blood-

pressure is an almost constant precursor of eclampsia, sometimes even preceding the appearance of albumin in the urine.

For taking the blood-pressure a mercury instrument is best. The arrangement is shown in Fig. 45. The cuff is adjusted smoothly and the bell of the stethoscope placed



Fig. 46.—Getting blood for Wassermann test.

just over the brachial artery, which is about 1 inch from the inner bone of the elbow.

Now the mercury is pumped up until the nurse cannot

hear the heart sounds. Then the air is allowed to enter little by little. The first or systolic reading is made the moment the first sound becomes audible. There is discordance of medical opinion about the diastolic reading.

Some doctors call the reading when the sound just disappears the diastolic pressure, others, the reading when the sharp thumping sound begins to soften. The doctor may ask the nurse to observe and record both. The normal readings for a pregnant woman are between 105 and 120 systolic and 65 to 80 diastolic pressure. The nurse should report all pressure above 130. Blood-pressure readings are made every three weeks up to the seventh month, thereafter every two weeks, and in certain cases every week or even daily.

The temperature of the patient is to be taken even if she does not feel feverish. A latent tuberculosis or pyelitis or cholecystitis or sinusitis may thus be discovered.

The weight is also taken and recorded. A rapid increase in weight may be due to edema, which indicates toxemia, or to fat, and shows endocrinal disturbance, which, in turn, has important bearings on pregnancy and the conduct of labor.

The Wassermann test for syphilis, since syphilis causes so many fetal deaths, is routine practice in some hospitals and the nurse may have to obtain the needed blood. The method is described here for this reason and also because intravenous therapy is gaining vogue and the nurse should know how to insert needles into the veins (Fig. 46). The upper arm is constricted with a rubber tube so as to cause the veins to fill visibly. The skin is disinfected with alcohol and the needle, No. 14 and sharp, armed with a short rubber tube, is slowly pushed into the vein in a slanting direction, almost parallel with the skin surface and with the vein itself, being careful not to punch through the opposite wall. After 5 cc. of blood are obtained the constrictor is removed, the needle is withdrawn and firm pressure made for a few minutes over the puncture with a sponge soaked in alcohol; the test-tube is stoppered with cotton and put in the refrigerator with a minimum of shaking. When the nurse is asked to give digalen or other medicine intravenously, she proceeds in a similar way.

Urinalysis.—Of signal importance in prenatal care is the examination of the urine. This should comprise at least the tests for albumin and sugar and the microscopic search for casts. The nurse should consult appropriate text-books for technical details. A simple home expedient might be mentioned as a readily available means for finding albumin when a test-tube is not at hand: Boil a tablespoonful of urine over a lamp and add a little vinegar. A white precipitate is albumin.

The total amount of urine passed in twenty-four hours should be measured at least every two weeks, because a marked diminution of kidney activity might mean nephritis. Instruct the patient as follows: Provide a 3-quart granite pail; wash and scald it; void at 8 A. M., discarding this, but collecting all urine passed thereafter until next day at 8 A. M.; put a teaspoonful of chloroform in the vessel and keep it in a cool place; send to the doctor or clinic 6 ounces of the collection in a clean scalded bottle, labeled distinctly with name, date, and total amount passed.

Some physicians wish also a clean fresh A. M. specimen because the casts are not eaten up by the bacteria or dissolved.

Urine for Aschheim-Zondek Test.—The patient is supplied with a sterile 6-ounce bottle containing 6 drops of a toluene solution (preservative). She is instructed to void into a sterile basin after washing the externalia well with soap and water. The first morning urine is required. The bottle is sent to the laboratory without delay.

During pregnancy the urine is examined every three weeks up to the seventh month, thereafter every two weeks, or weekly, even daily in suspected cases, as we do the blood-pressure. It is best for the urine and blood-pressure examinations to alternate, *i. e.*, one week the urine is sent, next week the patient herself appears for blood-pressure, etc., the physician thus learning the woman's condition twice as often. Albuminuria is an almost constant precursor of eclampsia.

The Applied Hygiene of Pregnancy.—The author sup-

plies each expectant mother with a booklet of general instructions. This also gives minute directions for calling the hospital, the doctor, and what to do in emergencies. Attached to the inside of the cover is an envelope containing printed gummed labels for the urine bottles, and one giving the doctor's, nurse's, and hospital's telephone numbers to be affixed to the patient's telephone.

The author will be glad to send a booklet to any nurse requesting it.

To women living far from the office urine bottles encased in mailing tubes are supplied.

The Children's Bureau of the United States Department of Labor issues a practical booklet on prenatal care, written by Mrs. Max West, obtainable on request. Both Dr. J. M. Slemmons' and Dr. Fred. C. Irving's books, *The Prospective Mother*, are excellent.

The nurse will often be in the position to help the young mother with advice, and to teach her the hygiene of pregnancy which she has learned in the preceding pages.

On Guard.—Another field in which the nurse may be very helpful to the patient and the doctor is in the studied supervision of the case, early to discover and thus successfully prevent diseases and accidents. She will often be asked about minor disturbances of pregnancy, and may be able to detect in them the first evidences of disease. (See p. 330.) The largest factors in maternal and infant mortality are: infection, toxemia (hyperemesis and eclampsia), premature interruption of pregnancy, heart and lung diseases, syphilis, and contracted pelvis, and the nurse must have an intelligent understanding of their nature and symptoms so that she can guard the patient against them.

Preparation for Labor at Home.—Even if a gravida is to be delivered in a maternity a little provision is needed at home for a possible premature or unexpected delivery, and also some supplies must be made for the use of mother and baby on their return from the hospital. Nowadays, owing to the Depression, many more babies are born at home.

For a home confinement the nurse will be expected to secure conditions which closely resemble those of the maternity, and with a little thought, tact, and skill a very satisfactory delivery room can be improvised, this too when the circumstances are very poor, and the available utensils, linen, etc., very meager. The principles of the prevention of infection are really very simple—first, the disinfection of the field of operation, and second, the absolute asepsis of everything that comes in contact with it, *i. e.*, the absolute cleanliness of the hands, the instruments, the sponges, towels, etc., that touch the parturient canal. So simple are the means of prevention of puerperal infection, yet there die annually in the United States 6000 women from this disease, and perhaps 100,000 sicken with it. Nearly all of this misery could be averted if but these two principles were appreciated and honored.

Preparation of the Room.—The sunniest and best room in the house should be selected for the labor. It should not have been recently occupied by an infectious case. It should be near the bath-room and be properly heated. The nurse should tactfully give instructions that, about two weeks before the date of confinement the room should be cleared of all unnecessary furniture, dust catching bric-a-brac, hangings, rugs, etc., and then thoroughly “house-cleaned.” A washable floor is desirable but if there is a carpet it will have to be protected at the time of labor by a large mackintosh or several layers of newspapers. A single bed with a firm mattress is preferable to a wide one. It should be about 30 inches high, raised if necessary on stout wooden blocks. Two plain chairs, a kitchen table, a sewing or euchre table, the dresser, and a rocker for the parturient, complete the furniture. In some families the nurse may meet objections to what they term unnecessary preparations. The patient’s mother perhaps was not delivered with so much fuss and ado. Here a little tact and explanation will clear the way. One cannot force advancement on the people—one must smooth them into it. The

requirements of asepsis do not demand the chamber be left inhospitably bare. As was said above, the principles of the prevention of infection are very simple and apply mainly to the patient directly. Provision should be made to have, when labor declares itself, good light in the delivery room, a bundle of newspapers (sterilized by baking in the oven like bread), and plenty of hot and cold sterile water.

The nurse should use the opportunity of the visit to the patient's home to study her manner of living, especially the hygiene—the amount of ventilation in the rooms, housewifely cleanliness, diet, exercise, etc., and, most tactfully, of course, she may act her rôle—for which a nurse is peculiarly well fitted—of health teacher.

The patient is usually supplied by the doctor with a list of articles to get. This list is one furnished to his patients by the writer:

LIST OF ARTICLES FOR OBSTETRIC CASES

- 3 basins (enameled).
- 1 pitcher (enameled), 4 quarts.
- 1 pitcher (enameled), 1 quart.
- 1 Perfection bed-pan.
- 1 fountain syringe (new), 2 quarts.
- 1 hot water bag.
- 2 pieces rubber sheeting, one piece large enough to protect mattress, one piece 1 yard square.
- 1 medicine-dropper.
- 1 medicine-glass.
- 2 bent glass drinking tubes.
- 8 ounces lysol.
- 1 bottle bichlorid of mercury tablets.
- 8 ounces tincture of green soap.
- 2 ounces castor oil.
- 1 tube white vaselin or lubricant jelly.
- 8 ounces alcohol.
- 1 ounce fluidextract of ergot.

4 ounces benzoinated lard.

1 rubber catheter, No. 14, French scale.

6 pounds absorbent cotton.	} These are used for making pads, sponges, applicators, etc.
1 bolt of gauze.	
10 yards unbleached muslin.	

100 vulva pads.

1 accouchement pad, 1 yard square.

200 applicators.

18 cord dressings.

1 skein linen bobbin, $\frac{1}{8}$ inch.

2 pairs white stockings, long.

4 breast-binders.

3 night gowns (short).

4 quilted pads, 2 feet square.

6 sheets.

18 towels (without fringe).

4 mason jars, 4 jelly glasses (with covers).

Bundle of fresh newspapers, 5 inches thick.

All the soft white rags the patient can gather.

Receiver for baby.

Most physicians themselves provide ether, chloroform, nitrous oxid and oxygen gases, with the necessary inhalers, also pituitrin, hypodermic ergot, and sterile salt for hypodermoclysis (it comes in glass ampules), with infusion needles, and all the instruments, suture material, rubber gloves, etc., but the nurse, if unacquainted with the practice of the particular doctor, should make sure that all these things are at hand when the time of labor arrives.

INSTRUCTIONS FOR THE OBSTETRIC NURSE

Sterilizing.—A few weeks before the labor the nurse should go to the patient's house and sterilize the following articles:

1. Six sheets.
2. Two dozen towels, old and soft ones, but without holes.
3. Six pillow-cases.

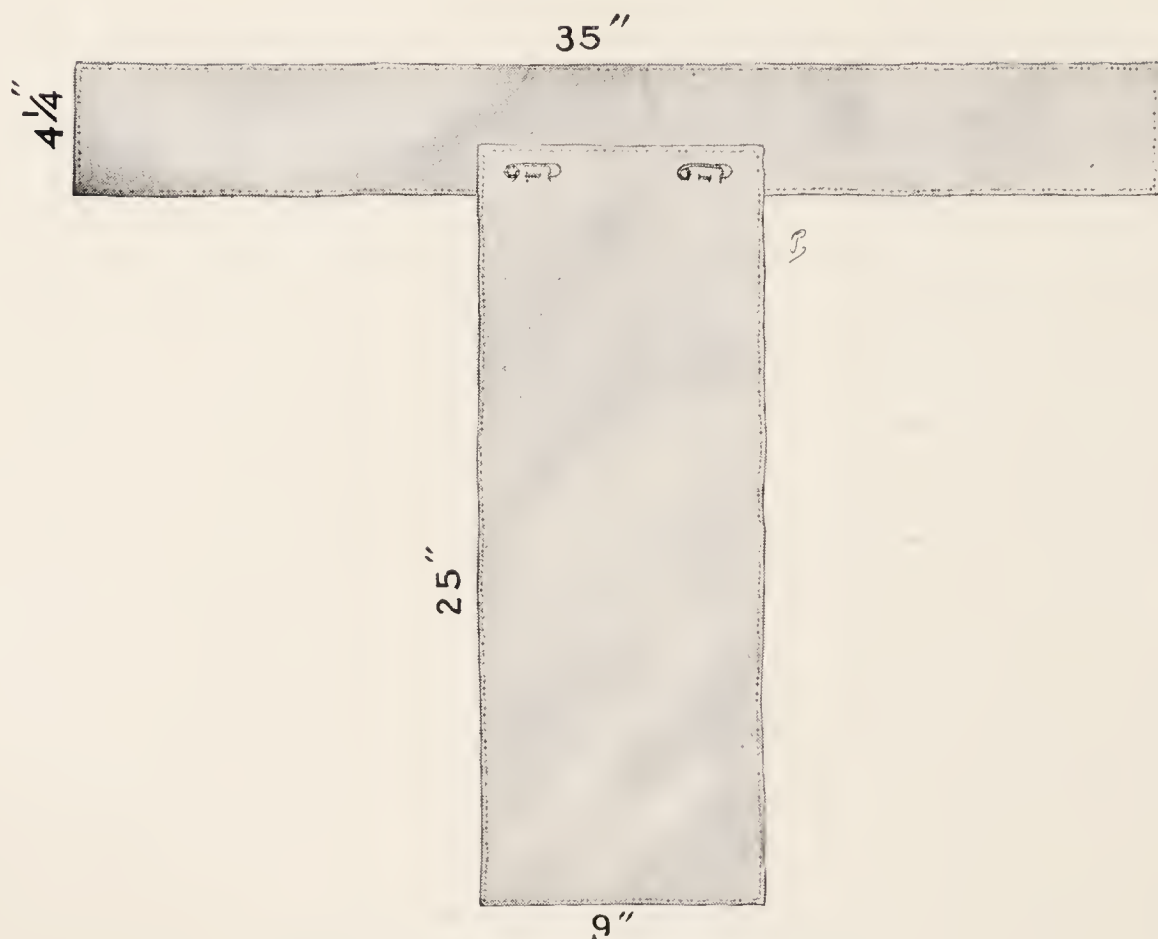


Fig. 47.—T-binder or pad-holder.

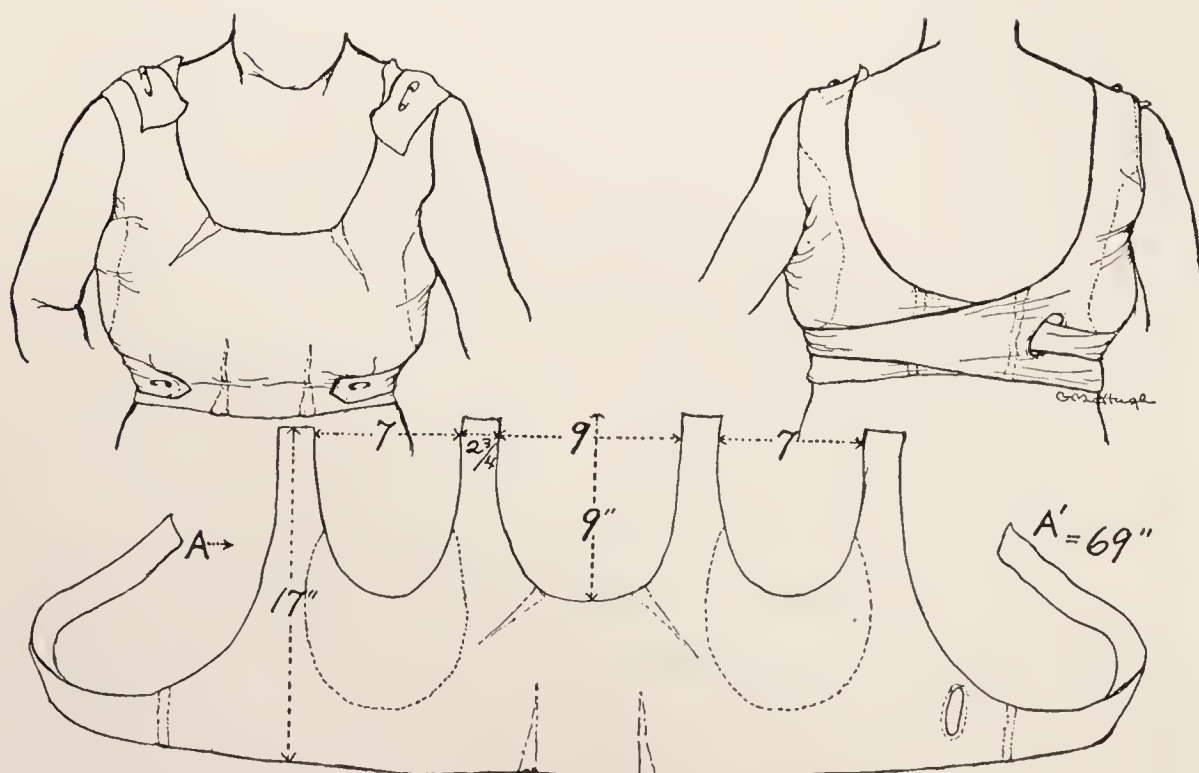


Fig. 48.—The Kelting breast-binder.

4. Four abdominal binders. These are of unbleached cotton cloth, 16 inches wide and 36 inches long, doubled and hemmed. (Some doctors do not use them.)

5. Four "pad-holders" or T-bandages, similar to the menstrual pad-holder (Fig. 47).

6. Three breast-binders of the size and shape given herewith (Fig. 48).

7. Two night-dresses of the smoking-jacket pattern for the mother, or two of the confinement jackets illustrated here (Fig. 49).



Fig. 49.—Jacket used during confinement. Chicago Lying-in Hospital pattern.

8. Two pairs of long stockings for the mother, so-called "opera lengths," and a pair of ordinary cotton-cloth leggings such as are used for operations.

9. Two men's gowns or surgical gowns, for the anesthetizer and the husband, if he is to be in the lying-in chamber.

10. Two obstetric pads of absorbent cotton, 1 inch thick and 1 yard square, covered on each side with gauze, and tacked. In lieu of these some nurses use squares of mattress

pad material ($4\frac{1}{2}$ yards make six pads) or a pad of newspapers covered with muslin. Four thicknesses of newspaper wrapped in a bath towel make an excellent pad.

11. Several dozen ordinary menstrual pads of cotton, covered with gauze, and which are long enough to be pinned to the binder before and behind.

12. Four quart Mason jars full of sterile cotton pledgets, the size of a lemon, for use as sponges during labor.

13. One Mason jar full of applicators, cotton wound on toothpicks (Fig. 50).



Fig. 50.—Cotton-wrapped toothpicks, known as applicators.

14. Two Mason jars of gauze pledgets for perineorrhaphy and cord dressings should also be very carefully sterilized. Mayo sponges, described on p. 565, are for perineorrhaphy and may be used again after sterilization.

Each package should be neatly covered with napkins and paper and distinctly labeled, so that confusion may be avoided at the time of labor.

After thorough sterilization and drying they should be packed carefully away and protected from the dust.

The basins, brushes, douche-bag, and pitchers should all be sterilized and put away aseptically, to be ready for use in case of emergency. (See p. 557 for Methods of Sterilizing.)

Maternity boxes may be purchased from the medical supply houses at prices varying from \$5 to \$20. They contain the various articles required, all sterilized, ready for use.

The Routine Prenatal Visit.—In city visiting nursing and in rural districts the nurse calls on the mothers in their

homes at regular intervals. Whether the patient is seen at home or in the physician's or institution's office, the routine is the same. Some physicians delegate almost the entire supervision of the gravida to the nurse, others have the nurse assist with the details. In both instances there are many opportunities for helpful service which is especially true of institutional prenatal nursing.

At each visit the blood-pressure is taken, the urinalysis studied, the patient interrogated for symptoms, and proper advice given. It is desirable also to take and record temperature, pulse, and weight. The examiner is particularly alert to discover any of the following symptoms:

- | | |
|--|-------------------------------------|
| 1. Nausea and vomiting. | } Hyperemesis gravida- |
| 2. Progressive loss of weight. | |
| 3. Edema of the feet or eyelids. | } Symptoms of threatened eclampsia. |
| 4. Headache. | |
| 5. High or rising blood-pressure. | |
| 6. Albuminuria. | |
| 7. Spots before the eyes, disturbed vision. | |
| 8. Dizziness. | |
| 9. Boring pain in stomach (epigastralgia). | |
| 10. Too rapid increase in weight. | |
| 11. Bleeding or bloody vaginal discharge. | |
| 12. Colicky pains in lower abdomen. | |
| 13. Abnormal absence of fetal heart tones. | |
| 14. Melancholia or other mental disturbance. | |
| 15. Dyspnea and cough (heart and lungs). | |

These are the danger-signals in pregnancy. They should be reported immediately to the physician and noted on the antepartum record.

In the long course of pregnancy the general physical examination may be repeated and, toward the end, the condition of the child is given more attention, particular pains being taken to estimate its size and physical development. A few weeks before labor an abdominal and rectal examination is made to determine the presentation, position, and engagement of the child in the pelvis, and the fetal heart-rate is counted, all of which is carefully charted.

Now the phenomena of beginning labor are explained to the patient and she is given explicit instructions as to how to call the doctor and the nurse and notify the hospital, also what to do should labor come on tempestuously. An important duty of the physician and nurse is to prepare the woman's mind for her approaching mental and physical ordeal, to which she looks forward with more anxiety than she will admit. She may be encouraged and assured that nowadays the science and art of obstetrics are so advanced that, with the prenatal care which she has enjoyed, women and babies do not die any more and also that the suffering of labor has been largely eliminated.

Organized Prenatal Care.—Without doubt the women of the United States need more and better care during pregnancy. Something big ought to be done to reduce the present high mortality and morbidity of the mothers and babies. Prenatal care is largely under government control in England and also to some extent in France and New Zealand. In the United States the only attempt to bring national influence into the situation is through the Shepard-Towner bill which some of the States have rejected. Many of the cities provide proper supervision of the expectant mother through antepartum clinics connected with maternities, visiting nursing associations, infant welfare stations, dispensaries, etc.

The Maternity Center Association of New York City is an admirable institution working to supply prenatal care to the poor of a certain district. It has no hospital affiliation, extending its protection to the patients of all institutions, physicians, and midwives within its influence. How it has met the problems presented by a crowded, mixed population, overcoming ignorance, prejudice, suspicion, and poverty, and how it has enlisted the co-operation of physicians and

midwives would make an interesting story, but it cannot be told here. The Association will be glad to furnish, at a nominal price, Routines, "Helpful Talks," blanks, and information which would be very useful to those engaging in similar work.

Practical knowledge of organized prenatal care can be obtained at the Chicago Maternity Center.

The rich and the poor are fairly well taken care of, but the problem is yet to be solved—how to provide good obstetric service for the great middle class. Perhaps this may come through the nurses.

Certain it is that when the public generally realizes how much can be done by prenatal care, how many mothers can be preserved, how many women can be rescued from wretched lives of invalidism, how many babies can be saved to the state, then we shall see a determined effort made to provide such care for all classes of society.

CHAPTER VI

THE INFANT'S LAYETTE¹

THE baby's layette depends a good deal upon the resources of the parents, and the simplest things are always the best. If economy is a necessity, flannellet can take the place of flannel and cotton the place of silk. The most important thing is to have enough clothing to keep the baby sweet and clean and warm at all times.

THE WARDROBE

Binders.—If the baby is born in the hospital, it is not necessary to supply binders, but if born at home, it will need three or four straight bands 20 inches long, 5 inches wide, made of flannel, flannellet, or gauze. These are used until the cord has dropped and the umbilicus is properly healed.

Three knit bands with shoulder straps of silk and wool or cotton and wool, size 1.

Three or four knit shirts or light weight silk and wool, or cotton and wool for winter. Silk or cotton for summer. Size 2.

Both bands and shirts if made of wool should be dried upon wooden shirt stretchers which should be bought to fit the shirts.

Three petticoats of flannel or flannellet. These can be made on a muslin waist or in the Gertrude style with muslin top piece. Petticoats should always open at the back rather than upon the shoulders.

¹ This chapter was written by Jessie F. Christie, R. N., Superintendent of the Chicago Lying-in Hospital.

Seven or eight simple dresses of soft material. Only the softest narrow lace edging should be used and very little of it. Omit ribbon bows or strings which tickle baby's chin and cheeks and keep it uncomfortable and fretful.



Fig. 51.—Infant's dress for the first weeks. Back view. Warren pattern: These are made of light-weight twilled flannel, are sleeveless, open at the bottom, and have a single slit at the back of the yoke. This dress is especially valuable for hospital work. It keeps the hands warm and prevents the child from scratching its face and infecting its eyes. It is easily and quickly changed. For the first two weeks of life it is highly recommended, and subsequently as a night dress. For summer use it may be made of fine Canton flannel.

Fine tucking and feather stitching are the prettiest trimmings.

Three or four night dresses which can be made of flannel-let. There are two very good knit night dresses on the market, the Arnold and the Vesta, which can be obtained

in two weights, for summer or winter wear. The same firms also make knit petticoats which are splendid for night wear. They are easily washed and retain their softness.

Three pairs of silk, silk and wool, cotton and wool, or cotton stockings, or three pairs of long hand-knit wool booties. These last are the most satisfactory, they do not shrink as machine-made woolens do. They are easily washed and fit comfortably over the diaper at the knee. Most babies have grandmothers who are very glad to knit such things for them. If not, they can be bought. Stockings should be dried upon stretchers to fit.

Four to six dozen diapers of cotton diaper cloth 20 x 40 inches. These can be bought in sealed packages or made at home. Two dozen cheese-cloth squares 1 yard square to use folded inside the diaper. Ten or twelve dozen pieces of clean white absorbent cloth 10 inches square (old linen or cotton) to be used inside the diapers.

Several Blankets for Wrapping Baby.—A useful wrap may be made of heavy flannellet 1 yard square, double, sewed around edges and quilted across two or three times. These are easily washed. Wraps may also be made of flannel, cashmere, Daisy cloth, or, best of all, knit with wool.

NURSERY CONVENIENCES

The Bed.—Avoid draperies of any sort. The mattress should be hair or cottonfelt covered with rubber or stork sheeting, which, in turn, should be covered with a mattress-pad and sheet. No pillow. The covering should be light but warm; woolen blankets are preferable. Nothing should be used around a baby's bed which cannot be washed.

6 or 8 sheets, cotton or Arnold knit.

1 pair of blankets.

4 mattress-pads.

6 small quilted pads to use on top of sheet.

There are many sensible baby beds on sale which do away with the basinet.

Good Scales.—An accurate scale is a necessity, the best being an ordinary even balance scale with weights. The fancy spring dial scales are unreliable and should not be used.

Dressing Table.—Most nurses and mothers prefer to care for the baby on a table. The folding dressing table is handy and can be obtained at all baby goods' stores.

Bath-tub.—The folding rubber bath-tub is very convenient, or one of white enamel on a stand.

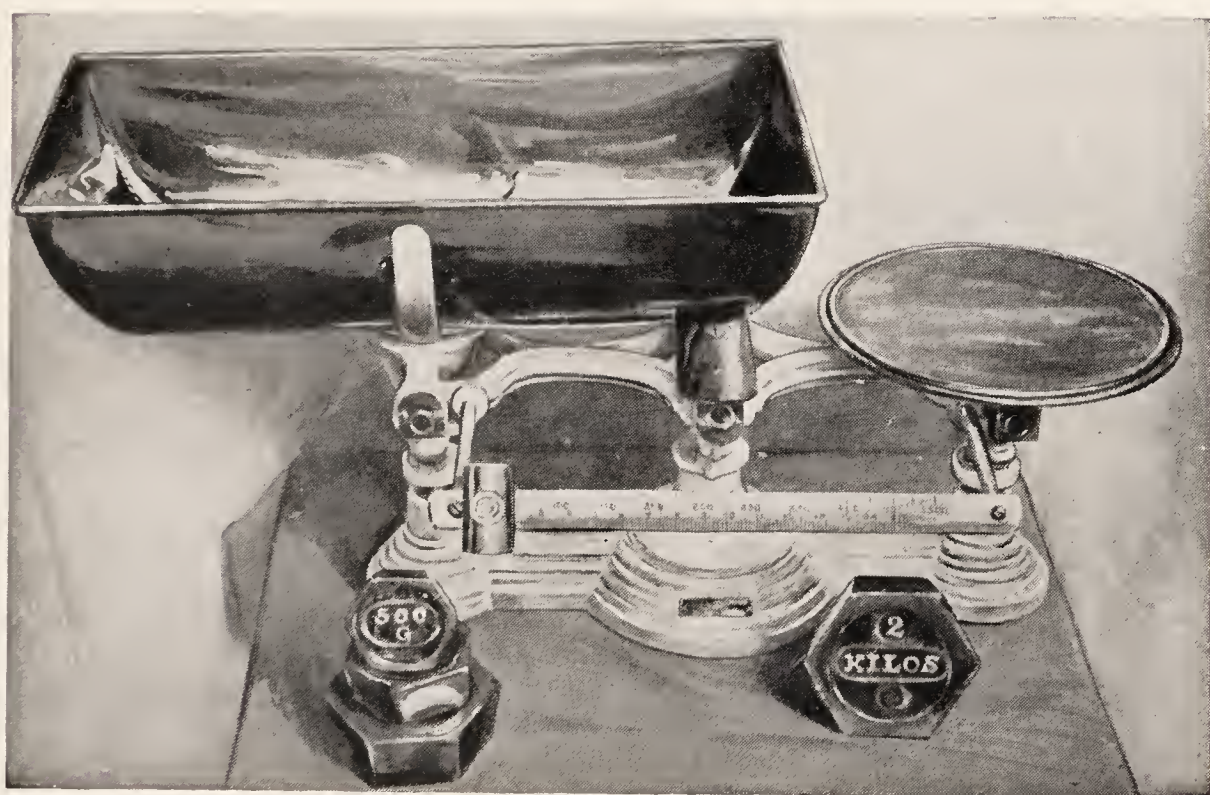


Fig. 52.—Best infant scales.

Small clothes bars for airing baby's clothes

6 soft towels. These may be made of cotton diaper cloth 27 inches wide and 1 yard long, or of soft Turkish toweling.

6 wash clothes made of gauze—four thicknesses, quilted.

1 enameled tray which should have upon it

3 jelly glasses with covers or 3 covered jars:

One containing applicators (see Fig. 50).

One containing cord dressings.

One containing sterile cotton.

- Jar of sterile solid albolene or benzoinated lard.
- 2 small bottles, one containing alcohol 60 per cent,
the other boric solution.
- Brush and comb.
- Needle and thread.
- Safety-pins.
- Rectal thermometer.
- Small pan for water for buttocks.
- Small cake of Castile soap.
- Tube of vaselin.
- Small can of plain dusting powder
- Bath thermometer.
- One hand basin.
- Large enameled pail with cover for diapers.
- 2 four-ounce nursery bottles for water.
- 2 anticolic nipples.
- Hot-water bag.
- Low chair without rockers or arms.

PART II

NURSING DURING LABOR AND IN THE PUERPERIUM

CHAPTER I

CARE DURING LABOR

How will the nurse tell when labor begins? First, by *the show*, which occurs a few hours before labor. Second by *the pains*. If the woman complains of pains first in the back, then drawing around to the front, and at the same time the uterus hardens (contracts), and if these sensations recur at gradually lessening intervals, it is safe to say the woman is in labor. Third, by *the dilatation of the os uteri*. Fourth, by *the rupture of the bag of waters*. The nurse is not allowed to examine the patient vaginally without instructions from the physician, but she should be able to examine rectally. The opening of the os is the most certain sign of labor. Without an internal, vaginal, or rectal examination the best observer may make a mistake as to the onset of labor, since the patient may have "false pains" at regular intervals. These may lead the physician to think the woman is in labor. Later the pains subside and the doctor calls the episode a "false alarm." The subsidence of pain may even occur after some dilatation of the os has taken place.

Intestinal colic may be mistaken for labor pains, but here the patient may notice borborygmus accompanying the cramps, and the uterus does not harden and relax rhythmically with them. These uncertainties are very annoying to the patient, doctor, and nurse.

Care During the First Stage.—As soon as labor is declared, the nurse begins to surround the patient with all the protective measures of asepsis and antisepsis that her art affords, and from now on nothing is neglected that will save her from puerperal infection.

The sterilized supplies are arranged conveniently on the dresser. The wash boiler and dipper are scrubbed, the former filled with water, boiled forty minutes, and set out to cool. The basins, pitchers, dipper, and bed-pan are sterilized as described on p. 573 and the kettle is made to sing on the stove.

A woman is liable to infection from the time labor begins until three weeks after delivery. Even before and after this time, if the germs introduced are virulent, she may be infected. A physician returning from a case of erysipelas had the unfortunate thought to examine his wife, who had been delivered seventeen days before. The woman died a few days later from infection. A student, in examining a woman a few days before labor, caused a fatal puerperal infection.

A nurse doing obstetric nursing should keep away from infectious cases, and, when she has been exposed, must make a complete change of clothing, take a full bichlorid bath, and shampoo her hair. At least a week must elapse from the time of her attendance on a pus or scarlet fever case, or other infectious diseases, before she assumes the care of a parturient woman. During this week she should take several scrub baths and shampoo her hair carefully. In practice it is hard to reconcile these duties, but the danger is too great to neglect such precautions. Other measures will be considered later under the heading of Puerperal Infection. It might be said here the reasons for these extra precautions in the case of the nurse are that she comes into such intimate contact with the mother and babe, and for so long a period of time, and so often during the day has to treat both surgically, as there are open

wounds. It is, therefore, highly essential that she be aseptic.

The general rules of asepsis are identical with those practised in the most particular operating-room. The care to be observed is identical with that observed in the course of a laparotomy, because the danger of infection is almost equal to opening the abdomen. The difficulties in attaining obstetric asepsis, however, are greater than in surgery, so that success achieved by the obstetric nurse is entitled to higher credit.

This is especially true in the home where the nurse works without the ponderous machinery of the hospital and the numerous co-workers of an established surgical technic. If, however, she understands the simple principles of asepsis and has command of one good method, she will readily adapt herself to all the doctors and circumstances she meets.

Another important function of the nurse during labor, as during pregnancy, is *watchfulness for symptoms that indicate trouble for mother or baby*. Here also, as during pregnancy, her duties depend on the practices of her doctors. In hospitals the interns are supposed to do much that is here prescribed. In the home the nurse may be very helpful to both patient and doctor, often saving the life of one and earning the gratitude and respect of the other, by being constantly on guard during labor, and discovering and reporting at once significant warnings of obstetric accidents. The most important of these are: **Exhaustion**, **eclampsia**, (p. 345), **placenta praevia** (p. 362), **abruptio placentae** (p. 362), **threatened rupture of the uterus** (p. 379), **prolapse of the cord** (p. 375), **asphyxia of the child** (p. 478). To avoid repetition the nurse is referred to appropriate chapters for a description of these complications.

Exhaustion is more common than most physicians and nurses think. If the nurse will put herself in her patient's place she will at

once appreciate with what misgivings and dread the young mother approaches her trial. Add to these the sufferings of the first stage, the long sleepless vigil, with insufficient nourishment, a process terminated by an ordeal of racking pain, which even anesthetics cannot entirely remove, and to these, furthermore, the loss of blood in the third stage, or eventual obstetric operation—and the nurse will understand why some women suffer shock after delivery, are slow in regaining strength, and occasionally remain neurasthenics for years. Dr. Crile has shown that fear and worry produce microscopic changes in the brain and may lead to postoperative shock. He recommends that no effort be spared to procure placidity of the mind before the operation is begun. The nurse can do much to prevent exhaustion and preserve the woman's courage by explaining away her fears, by getting her to take nourishment and as much sleep and rest as possible. This means that babbling relatives and friends are barred from the room; conversation should not include either levity or the recital of wonderful obstetric cases, which the patient will surely imagine are to be her fate; the nurse by a firm, self-reliant bearing will inspire in her charge a confidence in herself, her physician, and the art of obstetrics, which condition of mind will reflect itself in her physical condition and help to support her during the ordeal through which she is to pass.

While thus giving a part of herself to her patient let the nurse not forget to give a word of encouragement to the husband. He is also under a severe strain, how severe and how complex few nurses have taken thought to consider.

Preparation of the Room.—The room has been prepared as described on p. 121; if not, it is now cleared for action.

The nurse has her sterilized things at hand, usually on the dresser, which has been cleared of the toilet articles and covered with newspapers and a sheet. She has a pitcher of hot, and one of cold, sterile water, each covered with a hood, on a nearby table. The wash-stand, with basin, in which the physician and nurse wash their hands, should be thoroughly scrubbed, and a new piece of soap placed in a clean soap-dish or tincture saponis viridis provided. This wash-stand and soap should be reserved for the physician and nurse. A jar of sterile hand-brushes and a nail-file complete the number of articles on the wash-stand.

The wall around the table on which the hand solutions are set should be protected, using a newspaper, so that the decorations will not be marred, and throughout the case the nurse should exert constant care of the furniture and utensils of the house, so that they will not be broken or damaged by solutions, by hot basins, etc.

One may err with too much zeal, therefore the nurse should not make too great display of preparation, which

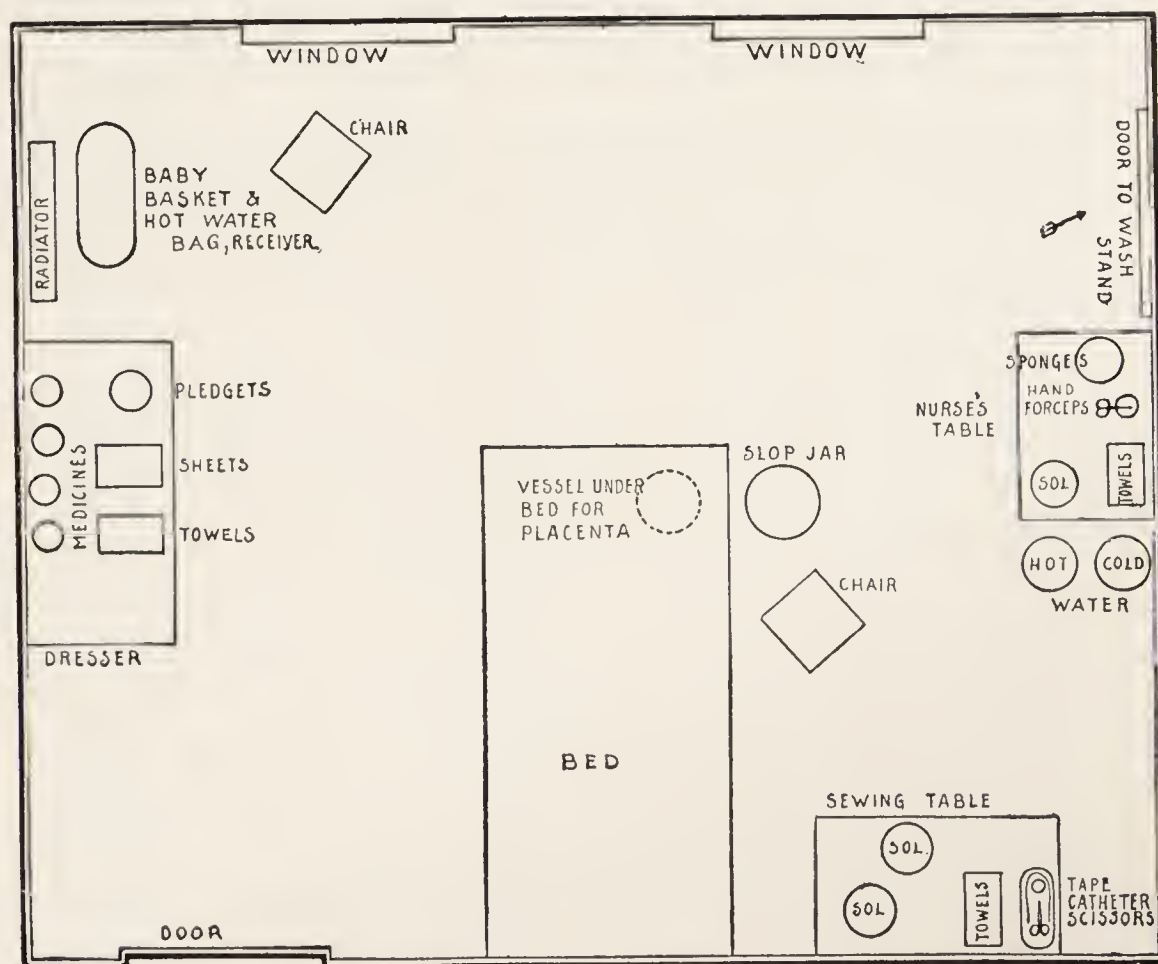


Fig. 53.—Diagram of room arranged for normal confinement.

might alarm the patient. The general arrangement of the room is like the diagrams (Figs. 53, 54).

Naturally, one will not always find conditions in practice which enable one to arrange everything as here given, but the diagrams will show what is needed and how things may be conveniently placed. The nurse who knows the principles of asepsis will carefully adapt herself to the exigencies of the individual case.

The Preparation of the Bed.—All hangings must be removed and the bed wiped with 1:1000 bichlorid solution on a damp cloth. The foot-board of the bed is to be covered with a sheet, pinned securely and evenly. If the bed has a box-spring, the valance should be removed or pinned up securely; then the side of the spring should be covered with some impervious material which hangs below the side rails

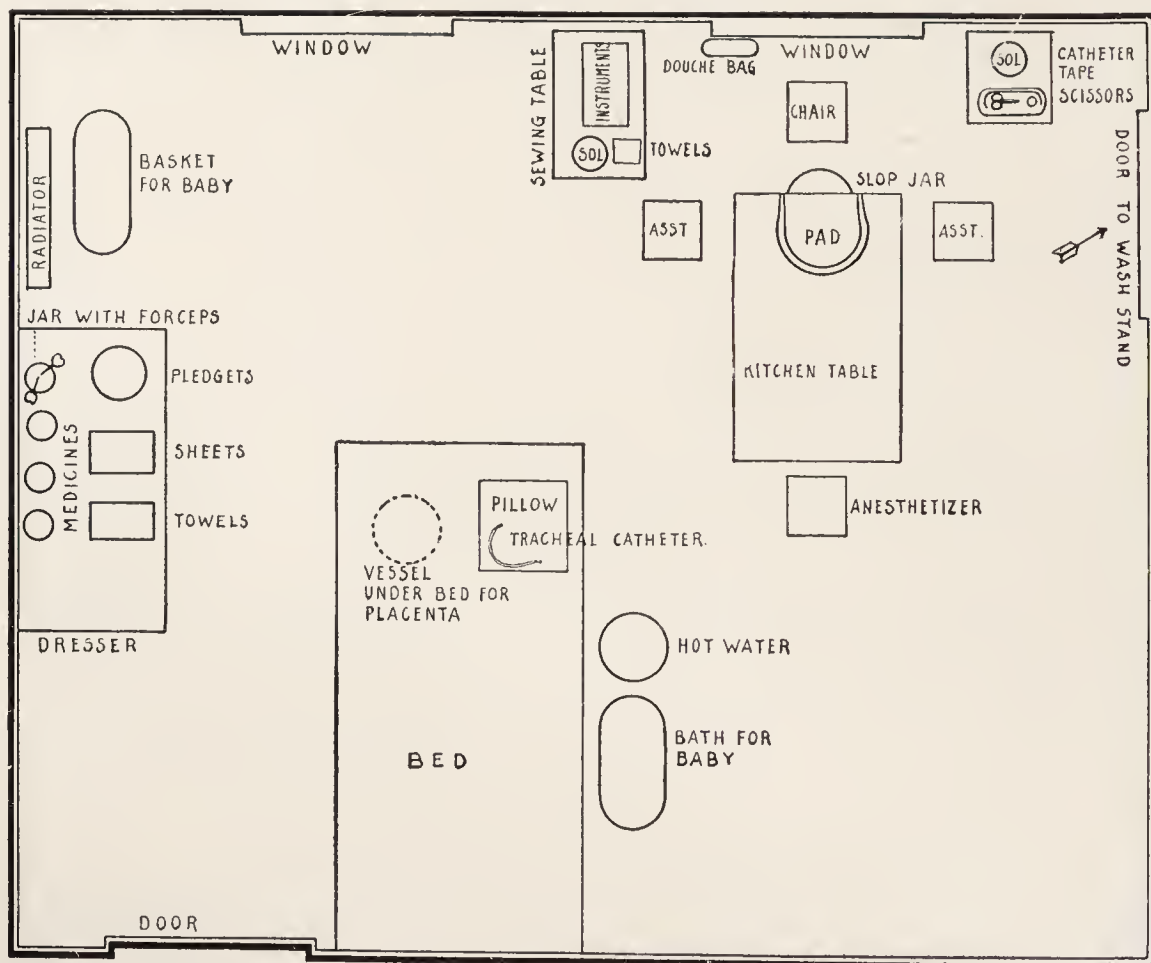


Fig. 54.—Diagram of same room as shown in Fig. 53, arranged for operation.

or boards. Three table boards or shelves from a bookcase should be put in the center of the bed between the mattress and the spring, so as to prevent sagging in the middle. The mattress is now covered with a rubber sheet, over this comes a full sheet, then a small rubber sheet, on this a sheet folded once, the draw-sheet across the bed, and then all are securely pinned with large safety pins. The patient should be warmly covered, depending on the season. In winter

she may need a hot-water bag at the feet. Occasionally one applied to the small of the back relieves the pains. The sterile sheets are put on at the first if there is a supply; if not, the bed is dressed with sterile things only when the second stage draws nigh. The nurse should have a clean light blanket for the patient, not a soiled old comforter. The best in the house is none too good for the parturient.



Fig. 55.—Patient across the bed, with preparations for the rectal or internal examination. Sheet used to drape patient. To the right is a sewing table with antiseptic solutions.

No one, unless dressed in a sterile gown, may sit or lean on the bed, and a sheet or pillow that has fallen on the floor must not be put back on the bed. When the patient is delivered on the side, something is needed to part the knees, and the nurse folds a pillow, covers it with newspapers, and then pins two sterile pillow-slips securely over it. (See Fig. 73.)

Preparation of Patient.—As soon as the patient is known to be in labor, the first preparation is made. It consists of shaving, shower-bath, enema, and antiseptic washings. A few physicians believe that only clipping of the hair is necessary, trusting to washing of the pudenda alone, and the absolute sterility of everything that is introduced into



Fig. 56.—First step for shaving. Drenching the parts freely with 1 per cent lysol solution.

the genitals. Patients are shaved for gynecologic and surgical operations in all the hospitals known to the author. Many cases of puerperal infection are due to lack of proper surgical preparation. If the labor is very rapid part of the preparation may have to be omitted—the bath, the enema, the shaving, but not the antiseptic washings.

Has the nurse ever done the first dressing of a compound fracture? Then she knows the principle of the procedure, *i. e.*, to cleanse and disinfect the immediate neighborhood of the wound, but **to allow nothing to get into it**. In the obstetric preparation of the patient the same principle applies.

The patient is put on a table or across the bed with the feet resting on chairs, the buttocks over the edge (see Fig.

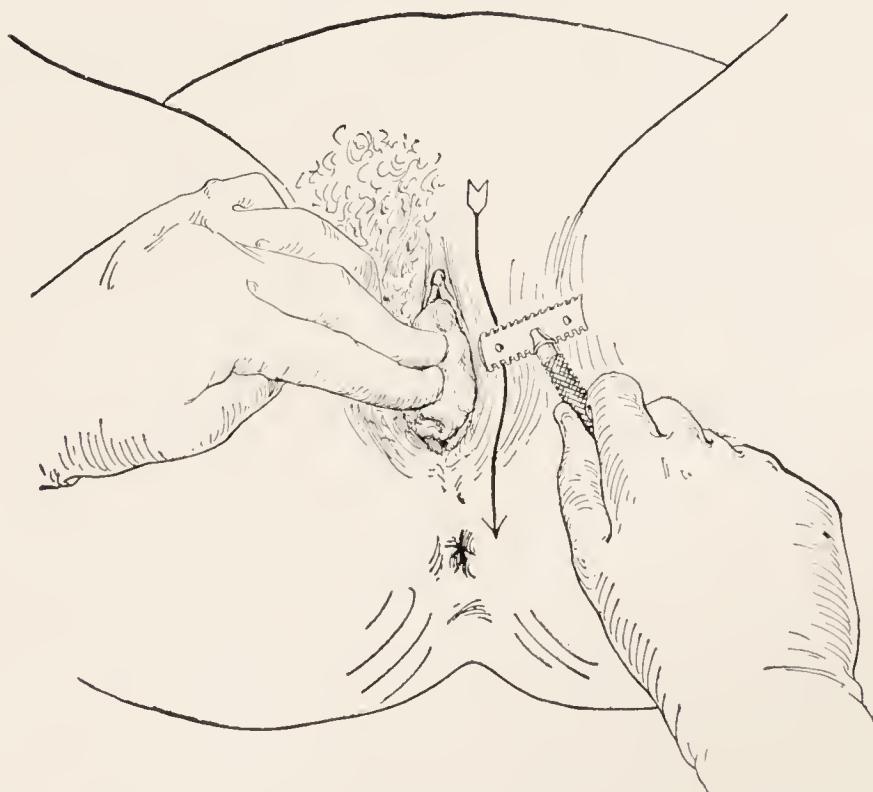


Fig. 57.—A sponge saturated with 1 : 1000 Hg. Cl₂ solution is placed in the vulva, the parts lathered freely, and shaved with a safety razor, the direction of the strokes being shown by the arrow.

117). The safety razor, soaking in 2 per cent lysol solution, the soap, water, lysol, and bichlorid solutions, or whatever the doctor prefers, are arranged handily. The nurse cleans her finger-nails and scrubs her hands thoroughly. First the vulva and the neighborhood are drenched with 1 per cent lysol solution. Some accoucheurs order spraying the parts with 4 per cent mercurochrome solution instead. This is to disinfect, as much as possible, the hair and scurf removed by the razor, and which might gain access to the vagina.

Then the parts are thoroughly soaped, taking time to make a good lather (but keeping it out of the vaginal opening!). Next shaving is done (see Fig. 57), being careful not to get any hair and soap into the introitus. Now the soap is washed off and the *clitoris cleaned of all smegma*, using applicators soaked in sterile oil or albolene, if necessary. The bath is next, preferably a shower, using a hand spray or bath ring. The body is drenched with warm water, liberally soaped, and briskly lathered, using a loofah or wash-cloth. The face is washed with soap and water

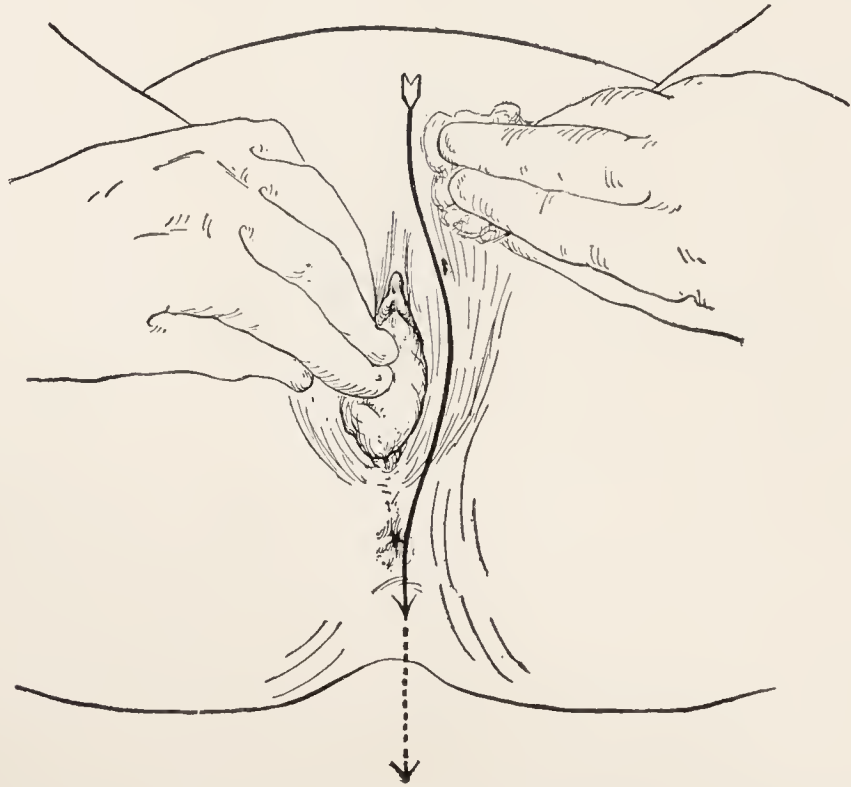


Fig. 58.—After shaving, a fresh sponge is held in the vulva, and the parts washed with the prescribed antiseptic solutions as shown.

removing all rouge and paint from the cheeks and lips,—important in cases of hemorrhage. Then the patient stands under the shower again, all the lather is thoroughly removed with friction, and the body dried. Now the enema of soapsuds is given, and after it has acted (slop jar or bed-pan) the patient is again put across the bed and the field of operation disinfected. The skin is first washed with soap and sterile water, the suds removed, then gen-

crously sponged with bichlorid and lysol solutions, paying particular attention to the vulva.

While washing the genitals the nurse holds a sponge in the introitus to prevent wash-water or other solution from running into the vagina; she must stroke away from the opening, and in washing the anal region a sponge that has passed over the anus must not pass over the vulvar orifice, but should always be thrown away (Figs. 56-59). After

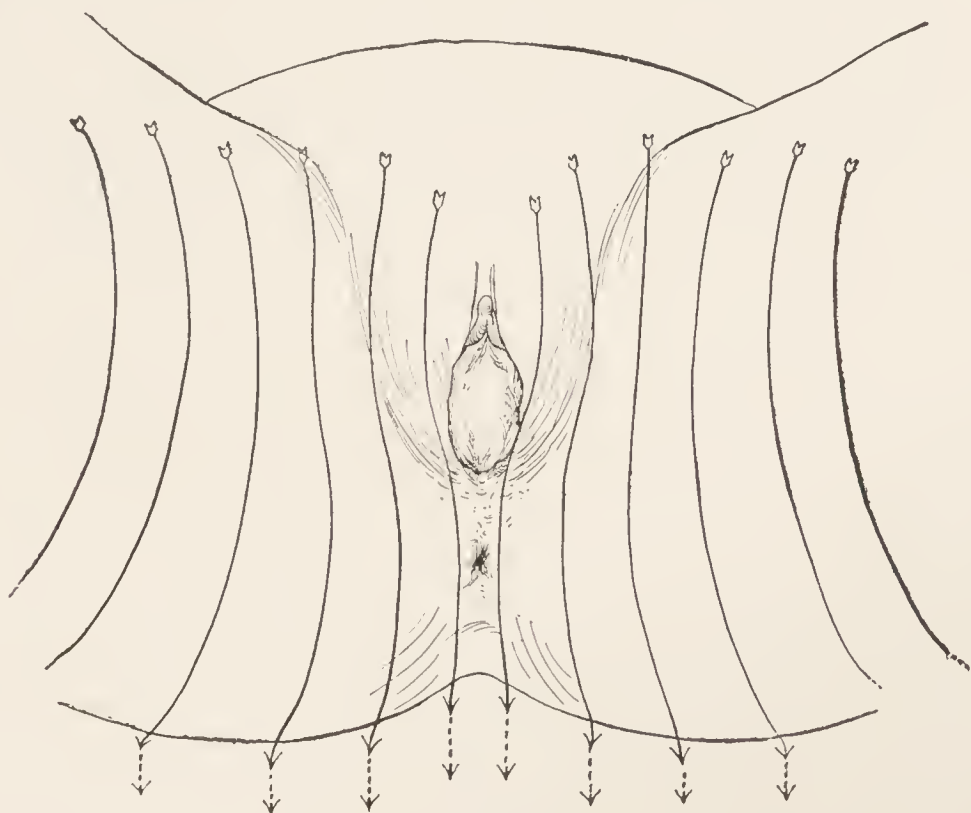


Fig. 59.—The arrows show the direction of the strokes. After the area around the introitus has been sterilized the sponge is removed, the labia separated, and the introitus is freely douched with the solutions. ~~Fig. 58~~ All the strokes are from the vulva outward, and great care is taken not to transport infection from skin not sterilized to an area already disinfected.

the vulva has been cleaned the nurse gently separates the labia and flushes out the introitus with both antiseptic solutions poured from a pitcher or bottle. The greatest emphasis in such a preparation is laid on this—not to let anything not sterile obtain access to the introitus. This may be more dangerous than not shaving and washing at

all. Freshly laundered underclothes are now put on. The hair is braided in two firm braids. The patient wears a loose house-wrapper. The confinement room must be warm enough so that the patient does not require heavy clothing.

The patient is instructed not to touch the parts and she must not sit on a water-closet after this preparation.

A sterile slop jar is provided for use in the confinement room, and a sterile bed-pan for the use on the confinement bed. If labor lasts over eighteen hours, another bath is given and the parturient dressed in fresh clothes.

At the Chicago Lying-in Hospital we have tried out two new methods of preparation of the patient for labor. Realizing that, in a busy maternity, carelessness and inadvertence may creep into all procedures and permit contamination of the vagina from the neighboring skin and anus, we began to use iodine and mercurochrome, hoping that by the aid of their germicidal action such transportation of bacteria could be rendered harmless.

Iodine is our old reliable antiseptic, mercurochrome has still to prove itself worthy of confidence. Iodine smarts a good deal and burns a certain number of patients, blondes and red-haired particularly. The technic is the same.

The first preparation does not differ from that detailed above, except that instead of drenching the vulva with lysol solution preparatory to the lathering, the abdomen and hairy parts are sprayed with 50 per cent tincture of iodine (or 4 per cent mercurochrome) by means of an atomizer. Care must be taken not to throw the spray over the abdominal prominence into the patient's eyes or upon the bystanders. The application may be also made with cotton pledgets held in a hemostat—the solutions are simply painted on. Some physicians practice, in addition, vaginal instillation of 4 per cent watery mercurochrome solution every eight hours throughout labor. For painting and spraying

the skin the following mixture is used, as it penetrates better: mercurochrome 40 grams, acetone 150 cc., alcohol 360 cc., sterile water 450 cc.

Our results have not been any better than with the first simple technic.

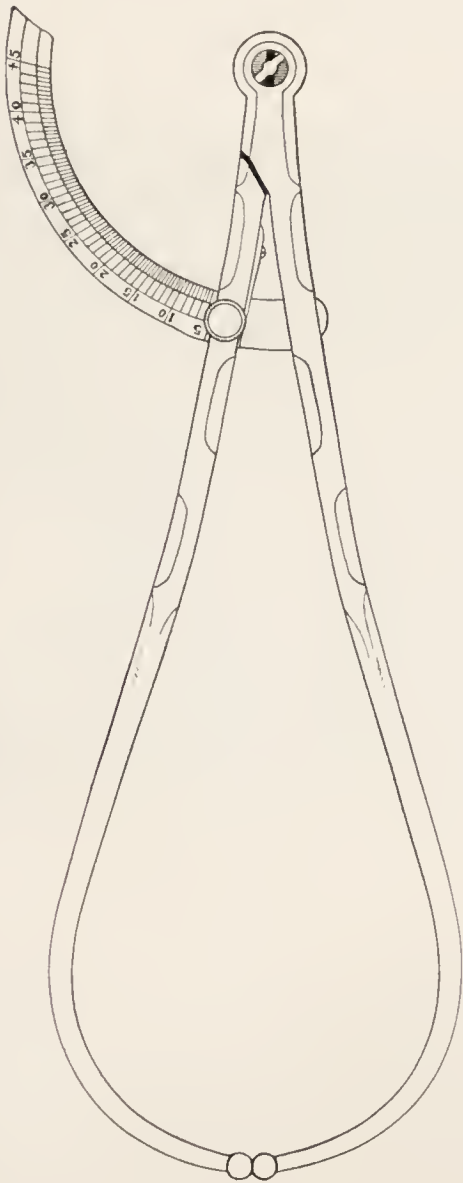


Fig. 60.

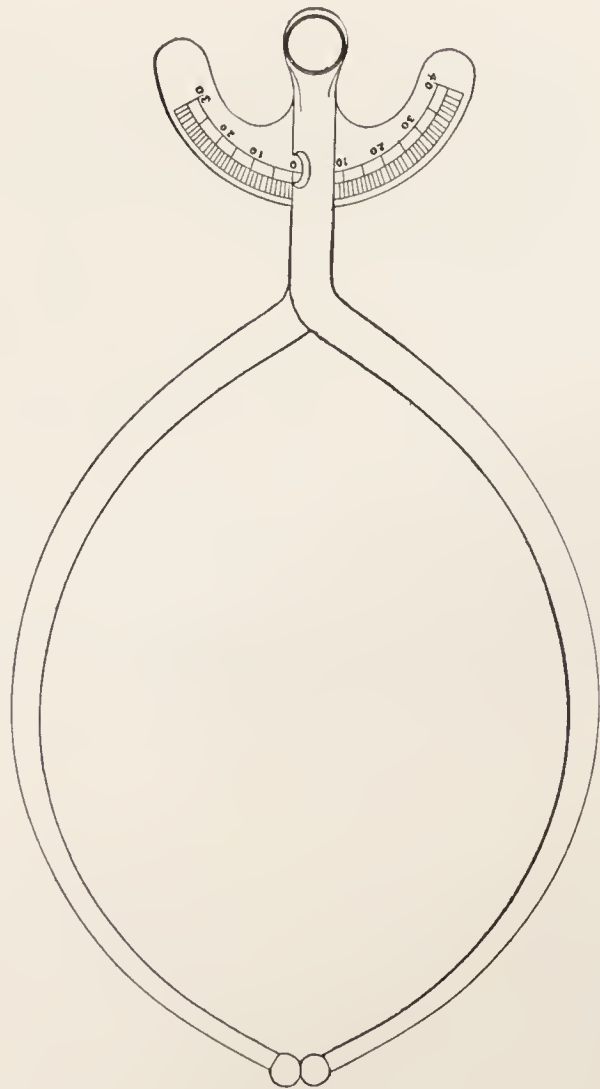


Fig. 61.

Figs. 60, 61.—Two types of pelvimeters.

Preparation for the Doctor.—Plenty of water for the physician to wash his hands, a nail-cleaner, and sterile brushes are provided, and antiseptic solutions are prepared according to his practice, which the nurse must inquire about. One per cent lysol, 1:1000 bichlorid, 1:4000

mercuric iodid, alcohol, di-phen, and 2 per cent creolin are commonly used. (See pp. 576-579.) Some accoucheurs sterilize the hands and lubricate the examining fingers with sterile vaselin. Other physicians use sterilized rubber gloves, which is by far the best way. A sterile gown or apron is provided for the doctor to wear during the examination. Most physicians wear a cap and face mask also.

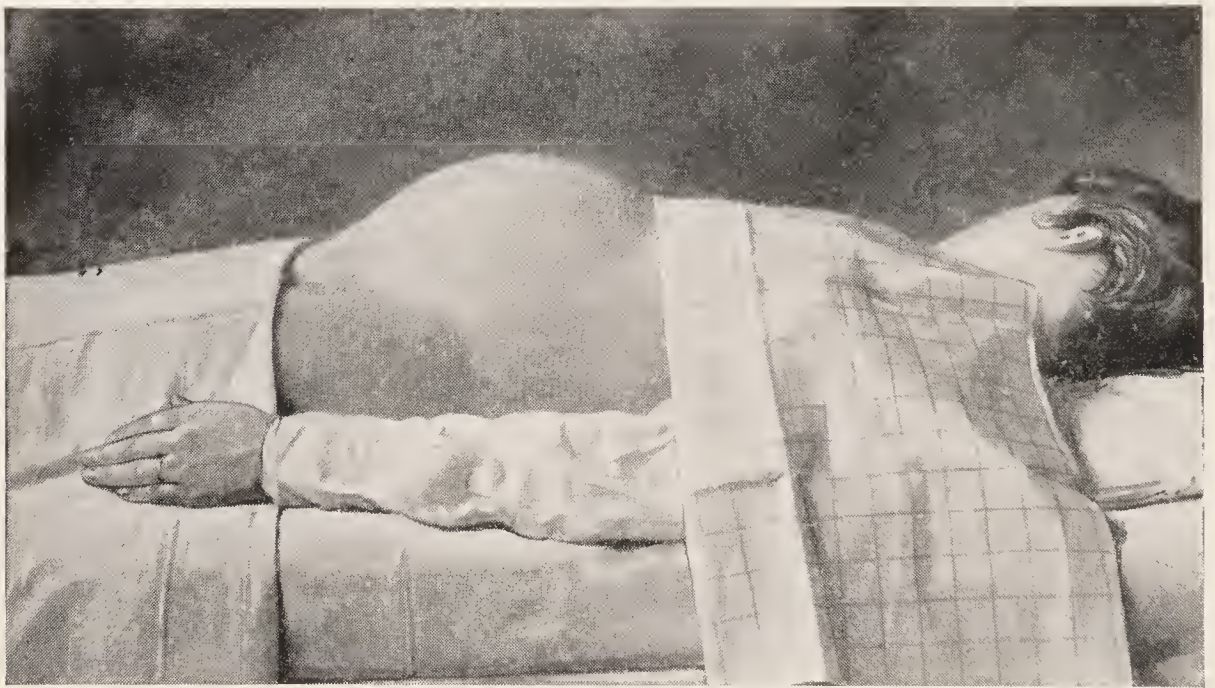


Fig. 62.—Patient prepared for the doctor's external examination.

Abdominal, vaginal, and rectal examinations are usually made. For the abdominal, the patient is brought to the side of the bed or lies on a couch, and the physician determines the position of the child by palpating the uterus, and counts the heart-beats. The accoucheur measures the pelvis, if he has not already done so, using for this purpose an instrument known as a pelvimeter (Figs. 60, 61). To prepare the patient for this examination a sheet is thrown over the lower part of the body and just covers the pubic region; the night-dress is drawn up over the chest and covered by a towel, so that the abdomen alone is exposed (Fig. 62).

After the external examination the patient is prepared for the internal examination, which may be rectal or vaginal (Fig. 63).

Preparation for Rectal Examination.—The bedclothes are neatly folded over the foot-board of the bed, the knees are drawn up and separated, a sheet of newspaper covered with a towel is slipped under the hips, a sheet is thrown with its center over the pubis, on a bias; the opposite



Fig. 63.—Patient prepared for the doctor's internal examination.

corners are drawn around each leg so as to cover it; the other two corners are drawn, one over the face and the other to form a flap between the knees. This is lifted up when the physician is ready to pass the hand for examination. The physician draws on a sterile glove, lubricates the index-finger with oil, vaselin, or tragacanth jelly. After the examination of the perineal region is cleansed (sometimes fecal matter escapes), and the towel removed. The findings are charted.

Preparation for Vaginal Examination.—Although the patient has had her first preparation, a renewed disinfection of the parts is necessary before each vaginal exploration, to avoid carrying bacteria, on the sterile glove, upward

from the introitus, into the uterus. This danger is so great that many physicians conduct labor exclusively with abdominal and rectal examinations. The doctor usually retires while the nurse is busy with the patient, since this involves much exposure of her person. He employs the time in sterilizing his hands.

The patient is placed on a sterile bed-pan and the nurse, wearing sterile gloves, washes the vulva, first with sterile soap and water, then with bichlorid, then with lysol solution, observing the precautions given on p. 145, against carrying infective material from an unclean area to a sterile field. A bit of cotton soaked in the solution is left between the labia, which the physician removes when he inserts the finger into the vagina. The bed-pan is taken away, a sterile towel spread under the buttocks, and a sterile sheet draped over the patient, as just described for rectal examination. The nurse steadies the patient's legs and asks her not to strain, but to breathe quietly through her mouth. After the examination the vulva and anal region are cleansed again with solution. These aseptic precautions are repeated before and after each and every examination. The doctor's findings are charted.

With the iodine or mercurochrome technic we proceed differently. The patient is placed on a sterile bed-pan, and the nurse, wearing sterile gloves, wipes off the blood, dried secretions, or feces which have often soiled the field, by means of moist cotton pledgets wrung out of sterile water. Great care is taken not to introduce the least particle of soil or fluid into the introitus vaginae. The surrounding skin is carefully dried with sterile cotton and then sprayed evenly with $3\frac{1}{2}$ per cent iodine or 4 per cent mercurochrome. The sterile nurse holds the labia minora wide apart to provide perfect exposure of the introitus vaginae while another works the spray.

For a simple vaginal examination only the inside of the vulva and the immediate vicinity are disinfected, but when

the final preparation for the delivery is made the abdomen, almost to the navel, and the thighs and buttocks for a distance of 10 inches, are to be thoroughly coated with the antiseptic. (See Fig. 64.)

When iodine is used, either swabbed on or sprayed, the anus is protected by means of a ball of dry cotton and care



Fig. 64.—Spraying the iodine or mercurochrome. Note pledget of cotton to protect anus when iodine is used. The solutions may also be painted on. The introitus vaginae requires particular attention.

taken that an excess of solution does not run down under the buttocks, while at the same time the application of the germicide must be thorough, and evenly distributed.

The nurse naturally will ask which method of preparation she should practice. Thus far I cannot see that our results as regards infection, rises of temperature, and the healing of perineorrhaphies are any different since we began to use new methods.

The Methodist Hospital of Brooklyn and the Ford Hospital of Detroit believe their results are better with them, and Dr. Williams, of Johns Hopkins, has gone over to mercurochrome. These facts indicate that the nurse will be doing well by her patient if she carries out carefully and efficiently any one of these three procedures, and she should therefore ask the physician which one he prefers, or carry out the one adopted by the hospital in which she was trained.

The Diet in the First Stage.—Most patients have no appetite after labor begins, but they must not be allowed to starve, since this causes faintness, which may delay the labor, or acidosis, which may contribute to the tendency to shock. Serious postpartum hemorrhage may result from the general weakness. Light semisolid food, especially water, sugar, food drinks, must be urged at regular intervals during the labor, particularly if it is prolonged. During summer the drinks from the soda fountain may be given. The food should be daintily served, and with quiet insistence the nurse can usually succeed in getting the patient to take sufficient nourishment. Some patients vomit throughout labor. Some food must, nevertheless, be given.

Neither food nor drink, however, is to be given if an anesthetic is in prospect. Vomiting during anesthesia is very dangerous. The stomach contents, aspirated into the lungs, may drown the woman or cause pneumonia or pulmonary abscess.

Bowels and Bladder.—The bowels having been emptied in the first preparation, as a rule require no further attention. If labor is long drawn out the enema may have to be repeated every eight to twelve hours, first asking the physician. The bladder must be emptied every four hours. If overfull (see Fig. 66) it, as well as a full rectum, may delay labor by preventing the descent of the head and inhibiting the uterine contractions. When the head has descended

into the pelvis it presses on the rectum and causes a fictitious desire to move the bowels.

The History Sheet.—As soon as a nurse arrives on a case she should start a record, and note the temperature, pulse, and respiration every four hours, and other things of importance. This record may be very valuable if the patient later develops a complication. The happenings during labor, the strength, length, and frequency of pains, the frequency of the child's heart-tones, the number of internal examinations made, the findings, the local and other treatment, the amount of sleep, the food taken, the total intake of fluid and output, the blood-pressure—all should be noted on the record with great care. Not alone does this keep the nurse in practice and prevent her from becoming careless and desultory in her work, but it also has a good effect on the physician, stimulating him to better effort, and giving him a high opinion of the good qualities of the nurse and of the nursing profession in general. Outside of all this, it is of distinct benefit to the patient, in that a carefully kept record will shed light on any complication that might arise in the course of the case.

Preserving Asepsis.—The field of operation has been cleansed and disinfected. Now, remembering that it is exposed for hours or days, what must the nurse do to keep it clean and uninfected? What can contaminate the field? Bowel movements, enemata, urinations, sitting on an unsterile slop jar, soiled linen, the general infective properties of a hospital, if the maternity is situated near the surgical and medical wards, rectal examinations or other manipulation of the parts by doctors and nurses without antiseptic precautions, self-examination by the patient, etc. When a colpeurynter has been inserted or a foot brought down in a breech case there is a real danger of bacteria wandering upward along the tube or breech into the uterus.

Bacteria deposited on the skin are not easily gotten rid of, and the final preparation of the patient for labor must

not be trusted to do this alone—we must prevent infection from getting onto the field during the first stage, however prolonged. What the nurse has to do is apparent from the list of the forms of contamination; antiseptic care of



Fig. 65.—A labor case in Holland in the seventeenth century (Witkowski).

the parts after enemata, defecation, urination; a sterile slop jar for use; sterile, or at least fresh clean linen for wear; proper isolation of the parturient woman from the infective influences of a general hospital; abstention from local manipulations and their performance only with sterile gloves; warning the patient against self-examination or even touching the parts; other measures will occur to the

nurse if she remembers the principle we are striving to carry out. Every four to six hours the nurse should clean the field with sterile water to remove dried blood, liquor amnii, meconium, etc., and then sponge it with lysol or bichlorid solution—avoiding the introitus vaginae. When a bag is in place (see page 321) the tube must be kept in an antiseptic condition,—we paint the 6 inches near the vulva with acriflavine compound every two hours.

General Instructions.—The nurse's bearing in the confinement room should be quiet, cheerful, and hopeful. The patient should be left much alone, so that the bowels and bladder may be attended to, and other services rendered by the nurse (Fig. 66).



Fig. 66.—Full bladder during labor.

Throughout the whole labor the nurse should see that the patient is not embarrassed by unnecessary exposure of her person. At some periods of the labor exposure of the body is necessary. For many centuries women were delivered under a heavy sheet (see Fig. 65), all the laws of asepsis being defied. The parturient must also be protected from drafts, since during labor the skin is moist and sensitive to chilling. During winter the patient often needs a hot-water bag at the feet.

During the first stage the patient may be up and walk around, lying down occasionally on the sofa. This helps

the pains and takes her mind off them. If the labor begins at night it is better for her to remain in bed and try to get some sleep between pains. As the second stage approaches, the pains coming closer together, and the patient complaining of their cutting or tearing character, the parturient will feel safer in bed on her back. She thus awaits the

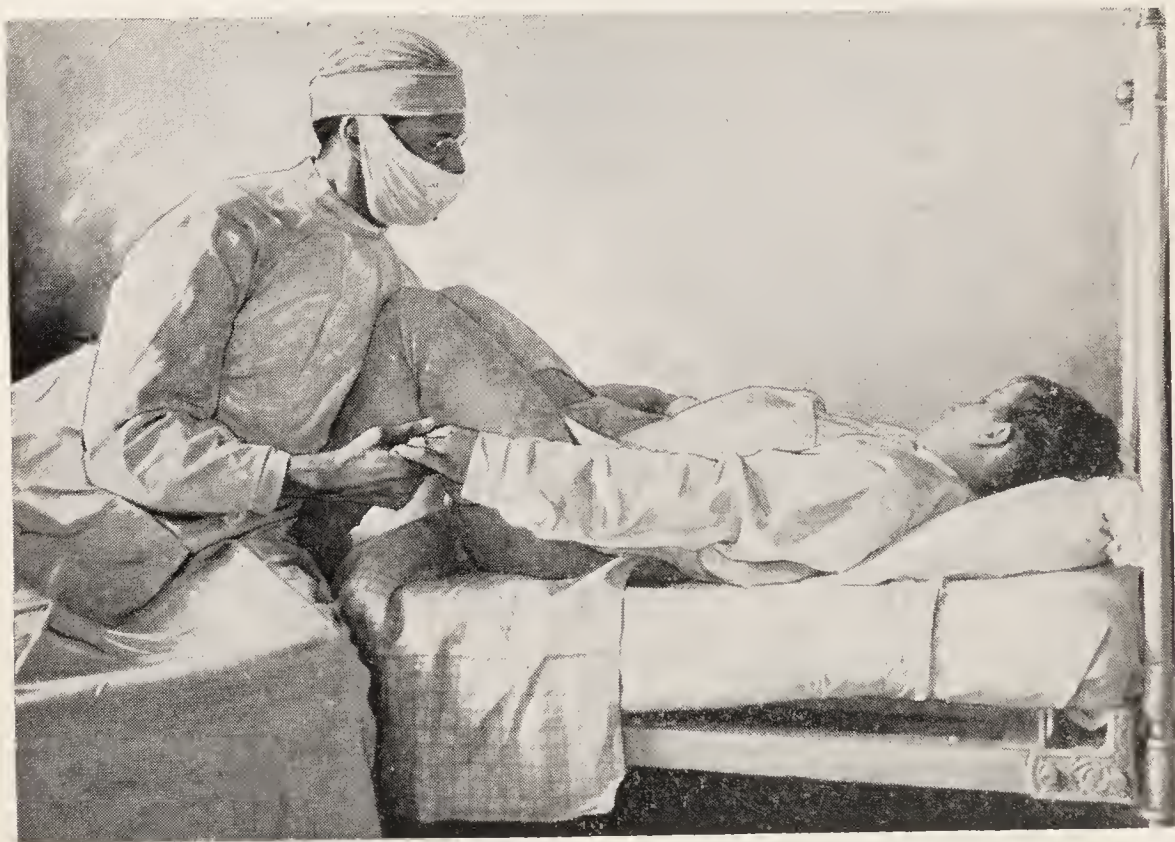


Fig. 67.—Attendant assisting parturient, and teaching her how to use her powers to best advantage. To be employed only after cervix is completely dilated and retracted, and upon the physician's order. When the parturient has learned how to bear down effectively she is to pull on the regulation straps or on a sheet fastened to the foot of the bed. Mouth cover for patient after the sterile drapes are on!

rupture of the bag of waters. When the waters break, the doctor usually makes an examination to see if the cord has prolapsed, to determine the amount of dilatation of the cervix, and the position the head occupies in the pelvis.

The patient may request that her husband be present in the room. During the first stage no objection may be made to this. During the second stage in most cases the husband

may be excused unless he is needed as an assistant. He is dressed in one of the sterile night-gowns and washes his hands carefully.

The nurse must study the strength and frequency of the pains and take note of the rapidity of dilatation of the cervix in order to determine the speed of the labor, thus



Fig. 68.—Determining the rate of advance of the head by pressing in the perineum. Careful not to enter vagina.

to be able to summon the physician in time. She must not allow the parturient to bear down during the first stage—it tires her out without advancing the child and tends to cause cervical tears and prolapse of the uterus.

When to Summon the Doctor.—It is best for the nurse to obtain exact instructions from the physician as to when he wishes to be called, especially regarding labors beginning at night. Some accoucheurs allow the nurse to take pelvic measurements, to watch the fetal heart-tones,

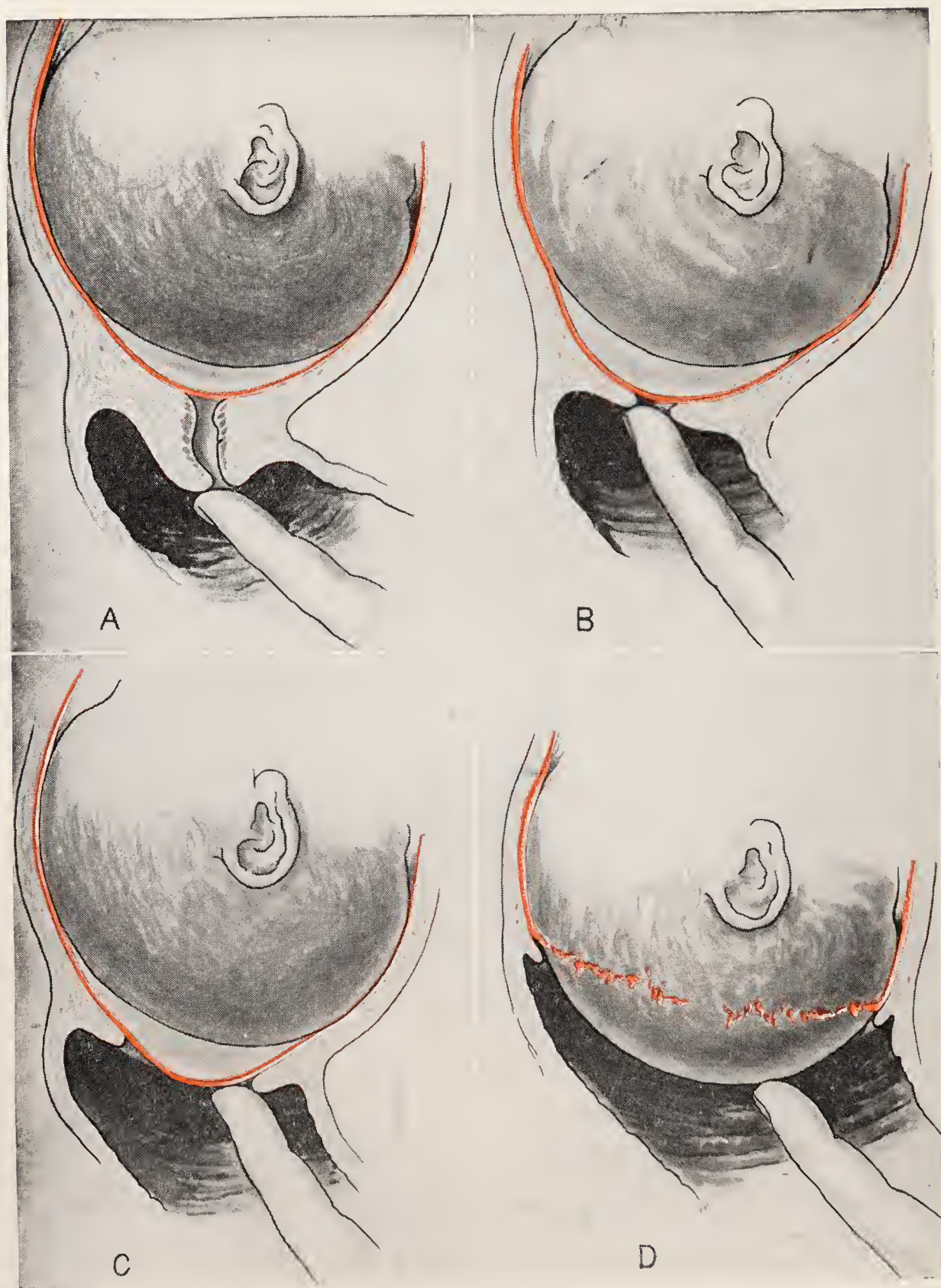


Fig. 69.—*A*, The cervix is closed and long. Red line indicates membranes. *B*, The cervix is effaced. The os admits one finger (1 cm.). *C*, The cervix is opening (5 cm.). Note pouting bag of waters. *D*, The cervix is fully dilated. The membranes have ruptured.

to make internal examinations, and actually conduct the labor until the head is about ready for delivery. Others place less responsibility on the nurse and wish to be notified when labor declares itself. After he knows that everything is in good condition the doctor usually leaves the patient to the nurse, returning from time to time until the second stage begins, then remaining until labor is completed. As a general rule the doctor should be summoned when the pains are at three-minute intervals, when they are regular and very strong, and certainly when there is bulging of the perineum. A good way for the nurse to determine if the head is advancing is to press upward alongside the pubis, as in Fig. 68. At first a hard resistance is felt deep in, which becomes more marked as the pains force the head down on to the perineum. If the head can thus be felt the physician is to be summoned. Abdominal and rectal examinations will also show the advance of the head and the amount of cervical dilatation, and the nurse should learn how to make them. The physician should be called earlier to a multipara than to a primipara, because in the former the second stage is shorter. He should at least be notified when the cervix admits three fingers in a multipara and four in a primipara, and when the bag of water breaks.

Of course the nurse must notify the doctor if the fetal heart-tones grow irregular, or too slow, or too fast; if the parturient vomits or complains of headache or other symptoms of eclampsia, if there is hemorrhage, or fever, if the pains are coming tumultuously, or when anything disturbs the normal course of labor. If the fetal heart tones get slow or irregular this may mean that the cord is compressed. After calling the doctor the nurse may put the patient in the Trendelenburg position (Fig. 184) to relieve the pressure. In the author's opinion such responsibilities in practice are too great to be placed on the nurse, they belong to the physician.

SUMMARY OF NURSE'S DUTIES, FIRST STAGE

1. Asepsis and antisepsis.
2. Watching for complications, both mother and baby.
3. Determining rate of progress of labor.
4. Keeping a full history.
5. Prevention of exhaustion, mental, physical.
6. Preparation for the actual delivery.

Care During the Second Stage.—The cervix is dilated, the head comes down on the pelvic floor, the stage of expulsion begins. This period lasts from a few minutes to three hours (longer in a primipara), therefore the nurse must prepare sooner for the delivery of a multipara and when the pains are strong and frequent. The complications to be guarded against this stage are: **Exhaustion, rupture of the uterus, abruptio placentae, and asphyxia of the child.** If the pulse is below 100 and the fetal heart beating between 116 and 160 per minute, and the patient tranquil between pains these accidents do not threaten.

The patient may feel better if pressure is made on the small of her back, or if that part be briskly rubbed, which the nurse may do. A hot-water bag may also be applied to the base of the spine. Occasionally washing the hands and face with cold water is also grateful. If the patient should have a cramp in her leg, which not seldom happens, the nurse stretches the limb out forcibly and pulls the foot toward the knee (Fig. 70). It is the understanding of these details of nursing and caring for the patient's comfort that distinguishes the successful from the unsuccessful nurse.

In the home the nurse may concentrate all her attention on her one patient and render her all the physical care she needs. Besides her actual nursing duties she will, in many little ways, let the parturient feel the bond of womanly sympathy existent between them. On the other hand, in a busy maternity the nurses are often so crowded

with routine duties or tired with long vigils, and harried by the demands of numerous doctors at one time, that they find it hard to give the many patients all the personal service each so richly deserves. Nor is it easy for the nurse to spread the magnetism of her sympathy over such a large number and for long periods. Giving of one's own self is exhausting. For these reasons the author is opposed to making our hospitals so large that patients become like grist in a mill.

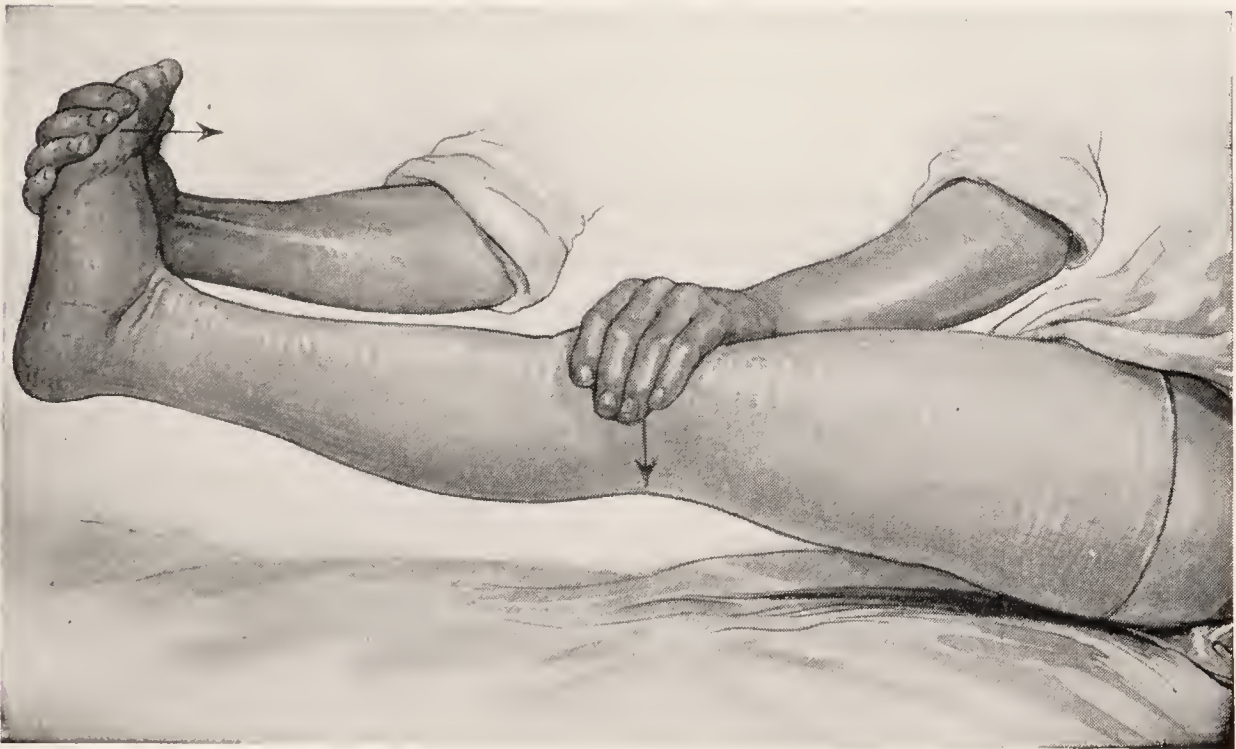


Fig. 70.—Nurse curing cramp in leg during labor.

The hint implied in these lines the author hopes will be taken to heart by his readers, but, he hastens to add, the doctor may also grow a little bit calloused to suffering from too long association with it, and sometimes may require to be gently reminded that there is a human being, in agony of both mind and body, on the confinement bed—perhaps the mother of little children and the cynosure of love and anxiety, not a mere “case.”

Let the nurse contemplate a woman in active labor—it makes no difference whether she is young or old, rich

or poor, fair or plain, married or not—all, when they are in a confinement jacket and leggings with the hair in two braids, all are alike. Let her drop her professionalism and step back and behold! What will she see? A poor human creature in the clutch of a mighty power, writhing in pain and anguish, as she responds to the primal command of nature, bringing a new human being upon the earth. If the nurse is spiritually minded this contemplation of the works of the Almighty will be tinged with religious awe, and she will need no other incentive to strengthen the resolve that on her part no effort shall be spared to guarantee that poor creature her life, her health, and the enjoyment of the child for whom she is risking both.

General Instructions.—The nurse, like a general on the field of battle, frequently surveys the room to see if everything is in readiness.

In a crowded flat the room is arranged as in Figs. 71–73, but if possible the supplies are distributed as follows:

DOCTOR'S TABLE

Basin of 1/1500 bichlorid.
 Basin of 1 per cent lysol, with sponges.
 Tray with sterile instruments.
 Tape or clamps with scissors for cord.
 Pile of sterile towels, half opened.

NURSE'S TABLE

Two pitchers of hot antiseptic solutions.
 Dressing forceps in tall bottle of 2 per cent lysol.
 Sterile receiver for baby.
 Basin containing doctor's sterile gloves or towel with dry ones.

DRESSER

Reserve supply of sterile towels, sheets, gowns, pads, etc.
 Medicines: Ergot, pituitrin, lysol, bichlorid, nitrate of silver for the baby's eyes, normal saline solution.
 Sterile douche bag or can.
 Sterile bed-pan.
 Hypodermic syringe, complete.

For the baby's reception there should be provided, close to the radiator or fireplace, secure from bright sunlight or drafts, either a crib or basket, containing a warm water

bag, wrapped up in a wool blanket, an identification tag (hospital), and, nearby, a tub with plenty of hot water, with bath thermometer, in case the doctor should call for a hot bath to receive an asphyxiated child. Near the head of the bed, opposite the physician on a chair, are the



Fig. 71.—Arrangement for normal delivery in a home. Side table carries: Sterile towels, sponges, hot and cold sterile water, antiseptic solutions, with pledgets, pan of sterile instruments for cord, and catheter. The bed is opened showing: *A*, Newspapers covering valance; *B*, table boards under mattress, *C*; *D*, sheet; *E*, rubber sheet folded back; *F*, draw-sheet.

anesthetizer's supplies; at the side of the bed is a slop jar. Against postpartum hemorrhage the nurse will have ready a hypodermic of pituitrin, one of ergot, the sterile douche bag and hot water, and gauze for packing the uterus, all close at hand.

Some physicians want to have the forceps and perineorrhaphy set boiled up for every case. Good light should be



Fig. 72.—Dresser arranged as a supply table. From left to right: Sterile gloves in container, supply of cotton sponges, sterile sheets and towels; medicines, hypo. syringe, pads, sterile douche can. Sheet is pinned up to show protective newspaper underneath.

provided, a clock placed where it can be readily seen, and the stethoscope kept within easy reach.

The proper time for the final preparation is about one hour before the actual birth of the baby. If the bed is dressed too soon, the sterile field, from long exposure,

becomes contaminated, and if one waits unduly the baby may come so fast that a complete "set up" is impossible. By observing the strength of the pains and the rate of progress of labor the nurse will usually be able to avoid both errors of technic. In hospitals the nurse, in the home either the doctor or the nurse, prepares the woman for the final act of delivery, wearing sterile gloves and using the technic described for the vaginal examination (p. 149).



Fig. 73.—Arrangement for delivery on side in a home. Hot and cold sterile water in pitchers. One basin has bichlorid, 1:1500; another, 1 per cent lysol solution. Scissors, cord tape, artery clamp, and catheter lie in a saucer in 1 per cent lysol solution. A pile of sterile towels and the nurse's hand forceps are on the table. In America this position is rarely used. In Britain many accoucheurs prefer it.

Then a sterile delivery pad is slipped under the buttocks, the operator dons a gown and changes gloves. The legs are wrapped in sterile sheets, leggings or towels, pinned securely with safety-pins or clips, and a sterile towel laid over the abdomen, letting one end drop between the thighs. For delivery on the back the woman lies as in Fig. 74, but

if the physician prefers delivery on the side, the hips are brought to the side of the bed, and the pillow before described is placed between the knees (Fig. 73).

The author believes that saliva, ejected from the mouth in speaking and coughing, falling upon open wounds and the sterile fields of operation, is a frequent cause of infection.



Fig. 74.—Patient arranged for the conduct of the third stage of labor. Notice that neither doctor nor nurse touches the sterile (?) drapes.

He therefore recommends that all persons directly concerned with a delivery—which is a surgical operation—doctor, nurse, anesthetizer, parturient, wear masks covering both nose and mouth.

The nurse, after everything has been arranged for the delivery, may be asked to scrub up and assist as she does at surgical operations, in which event she follows the training she has received in the hospital; or she may have to give the anesthetic, but usually her duties will consist of waiting on the doctor; renewing supplies of pledgets and solutions; adjusting the towels, pillow, sheet, etc., counting

the pulse, or the fetal heart, and little attentions about the patient, one of which is caring for any discharge from the rectum. If the enema has not completely emptied the lower bowel, as the head comes down the contents of the bowel are forced out and cause considerable annoyance to the accoucheur on account of the danger of infection from the feces getting into the vagina. Women have died from this. Aside from the danger of infection, the patient is much distressed about it; therefore the nurse should never allow her to learn that such an occurrence has taken place. The discharges from the anus are received in large pledgets of cotton soaked in 1:1500 bichlorid, taking care that nothing touches the vulva, and the perineum must be sponged with the same solution, always rubbing from the vulva toward the anus, and not using the same pledget twice. Should the physician soil his hand, he will resterilize it or put on new gloves, after which the nurse replenishes the antiseptic solution.

Some parturients are unruly, and persist, against advice, in putting the hands on the sterile abdominal towel or even on the vulva. In such a case the nurse should tie them loosely at the head of the bed.

The patient should help in her labor by bearing down. This will also satisfy her mind that she is making progress, tending to relieve the actual pain. The nurse should teach her how to bear down, *i. e.*, to take a deep breath, then close the glottis and not cry out, but strain hard as if at stool. She may also encourage her with reports of progress as the child advances. If the nurse is strong she may help the woman pull, as shown in Fig. 67, or the husband may help, the patient being sustained and inspirited by the touch of a human hand. When the field is decked with the sterile things, she may be allowed to pull on the head of the bed or on a sheet or straps, firmly fastened to the foot of the bed. A parturient should not be allowed to "work," *i. e.*, bear down, without the doctor's order.

When the child is coming through the vulva the nurse may have to administer the anesthetic, which is done as follows: The bottle is arranged for dropping by cutting a long slit in the side of the cork. An ether can may be provided with an excellent dropper as in Fig. 83, A. A handkerchief or an inhaler may be used. Just as the pain comes on 15 to 30 drops of ether are dropped on the handkerchief; after a few moments a little more is put on, and as the height of the pain passes the mask is removed from the face. Toward the end of delivery the administration is more continuous, but ceases immediately the head is born. The nurse watches the doctor for instructions as to whether he wishes more or less of the anesthetic given. More ether is required than chloroform and the inhaler is adapted to admit less air (see Fig. 83). One may use a cone of paper covered with a towel (closed method), or a mask covered with four layers of cotton flannel, surrounding the face with a towel (open method). When ether is used one should not be too near an open flame, since the vapor is explosive. Chloroform is decomposed by an open flame into irritating and poisonous vapors (see page 190).

As soon as the head is born the nurse must have ready gauze pledgets for wiping the nose and mouth. Soft old linen or lintine is the best for this purpose, and great gentleness is practised to avoid abrading the tender mucous membrane. Mucus is safest removed from the throat by means of the gloved finger after it has been brought into the back of the pharynx by upward stroking of the neck. Even gentle rubbing with gauze may scratch the fauces and cause Bednar's aphthae. The passage must be cleared before the baby takes its first gasp, to prevent choking and infection of the gastro-intestinal tract arising from swallowed vaginal secretions, etc. As a means of avoiding eye infections (since the vaginal mucus sometimes contains virulent germs) the eyelids are gently cleaned with dry

sponges, stroking from the nose outward. (See Treatment of the Eyes, p. 179, and Asphyxia Neonatorum, p. 479.) When the baby comes, it is received in a warm towel, and allowed to lie a short distance from the mother, far from the soiled pad under the pudenda, the nurse taking care that it does not pull on the cord, and that the mother does not lie on it or squeeze its head between her legs.

The child must not be exposed, because it is very subject to chilling, being so wet. A sterile basin or bedpan is placed under the vulva (Fig. 74).

In maternities the infant should now, before the cord is cut, be marked, to avoid every chance of confusion in the nursery. A number of methods of identification are recommended. We have learned by experience that no single one can be trusted, but that two or more are to be so combined that one acts as a check upon the other. (See page 182 for the Chicago Lying-in Hospital practice.)

Now the doctor requires the bowl with tape for cord and scissors—he disinfects, ties, clamps, and cuts the cord. The maternal end of the cord is clamped with an artery forceps to keep the residual blood in the placenta, thus making it a firmer body for the uterus to contract upon, also because a twin still undelivered might bleed through the cord of its brother, and further, to keep the bed clean. The clamped end is laid in the groin in such a way that the cord does not trail over the rectum.

Severing the Cord.—This is a vitally important operation. If the vessels are not tightly compressed, hemorrhage, sometimes fatal, may occur. If the asepsis is not perfect, infection may enter the abdomen—as may occur in any laparotomy. This usually takes the form of an umbilical phlebitis with fatal pyemia. The methods of treating the cord are many, too numerous to mention here, but all have two principles—the vessels must be occluded and the asepsis must be absolute.

THE AUTHOR'S METHOD.—1. Disinfect the gloves which may have been soiled by vaginal secretions, or put on sterile ones before tying the cord.

2. Wash area around navel and 4 inches of cord with 1/1500 Hg Cl₂.

3. Surround field of operation with sterile sponges or towel.

4. Paint proximal 2 inches of cord with half strength tincture of iodine, or 4 per cent mercurochrome.

5. Tie tightly with sterile tape $\frac{1}{2}$ inch from skin edge, taking care not to include a possible hernia.

6. Clamp cord 1 inch from the tie.

7. Cut $\frac{1}{4}$ inch beyond tie with sterile scissors (not those used on the mother).

8. Paint end of stump and tape with the germicide.

9. Dress with sterile lintine or gauze.

10. Sterile abdominal binder.

After the baby is separated from its mother it is wrapped in a warm receiver, with the face exposed, and placed in the warm basket, on its side, with the head lower than the body, so that mucus can run out of the throat and mouth. It is immaterial which side the child lies on, but it is important that he cries lustily to prove that his lungs are expanded. At the earliest possible moment the nurse informs the father of the birth, adding a few heartening words to release him from his anxiety.

The nurse must watch the infant closely to see that it does not choke and that it does not kick all the covers off; that it is not near a window or in a draft, and that the cord does not bleed. She may have to delegate some of these duties to the father or some relative if her services are required by the patient or by the doctor.

SUMMARY OF DUTIES: SECOND STAGE

1. Protecting patient from infection.
2. Watching fetal-heart tones.
3. Teaching woman how and when to bear down.
4. Watching for signs of impending danger.
5. Preparation for complications.
6. Assisting doctor at delivery.

It must now be plain to the nurse that an obstetric case is a surgical case, that labor is a surgical operation, and that the obstetric surgeon must prepare and care for it as does the general surgeon for his operations. This means the patient is brought into as fit physical condition as possible beforehand; her mind is divested of all fear of the ordeal itself and of the outcome; she is given the best obtainable protection against infection and provision is made for the prompt and successful treatment of all imaginable complications. And the nurse is to help him do all this! Truly a noble task.

Care During the Third Stage.—The third stage is a critical time in the labor. More women die during this period than in the other two. Hemorrhage, shock, embolism, or asphyxia of the child—any one or all together, may put the resourcefulness of the attendants to severe test. Errors in the aseptic technic are particularly fateful during the third stage because of the open wounds in the perineum, and the gaping vessels in the placental site. After the child is delivered the uterus is the size of a coconut, and usually the doctor requests the nurse to palpate it gently (Fig. 75) and note whether it is hard or soft. If too soft, she gives it a gentle massage until it hardens, and, as a rule, there is no trouble. If the nurse is uncertain as to its condition, let her not hesitate to ask the physician about it. As soon as the cord is tied the doctor usually takes the uterus, and the nurse is now free to rearrange and refill

basins, see a little to the baby, and to get things ready for the placenta.

After the child is removed the nurse takes away, if necessary, gently and without jarring the patient, all the soiled towels, etc., from about her, and puts a folded, dry, warm sheet, or a sterile obstetric pad under her. A sterilized basin or bed-pan is again slipped snugly under the



Fig. 75.—Nurse palpating the uterus during third stage to determine its hardness. Massage not permitted unless necessary.

vulva to catch all discharges. This prevents soiling the bed and enables the accoucheur to measure the quantity of blood the patient is losing. The nurse observes and notes the amount of blood in the clothes, so as to form some estimate of the total amount lost. Some physicians want the uterus held, others not. If the nurse is to guard the uterus (see Fig. 75), she must observe the following points:

1. That the uterus is hard, and that when it relaxes a little, as it should, it does not balloon out with blood.

2. She must look between the thighs every three minutes to see if blood is accumulating in the basin or on the clean sheet she has placed there.

3. She must keep her finger on the patient's pulse and her eye on the patient's face, to detect unusual rapidity of one and paleness of the other.

If there is a hemorrhage, the nurse must firmly but gently massage the uterus. The thumb lies in front, the fingers on the back, of the uterus, and together they describe circles on the organ, wiping the abdominal wall over the uterus—not kneading the abdominal wall, but the uterus. Of course, the physician is informed of it.

The nurse will notice when the after-pains come on that the uterus gets very hard and rises up under the hand. These contractions of the uterus loosen and expel the placenta. The contractions of the uterine muscle also prevent postpartum hemorrhage by constricting the blood sinuses and vessels which lie in the uterine wall. During the active uterine contraction the hand should be removed from the fundus. The separation of the placenta is shown by the uterus rising up in the abdomen, up above the navel, and the cord advancing from the vulva. It is usually time now to expel the placenta, though many physicians arbitrarily wait thirty minutes.

When the physician is ready to do this, the cord is dropped into the sterile basin under the vulva, and by light pressure on the fundus the after-birth is expressed from the vagina, from which it drops slowly into the basin. The technical term for this maneuver is "early expression." The membranes are carefully pulled from the uterus by gentle, steady traction, without twisting, so that they do not tear off. The physician will inspect the placenta and membranes carefully to see if a piece of either is left in the uterus—a serious danger, since it may cause postpartum hemorrhage and puerperal infection—therefore the nurse will place the basin containing them where he may see

them before he leaves the house. It would not be improper for the nurse to call the physician's attention to this point if he should forget it, and the information obtained might later be of signal service.

A dram of ergot is often given by mouth or one ampule hypo. if the patient is unconscious (Fig. 76). Some physicians also give an ampule of pituitary extract (into the

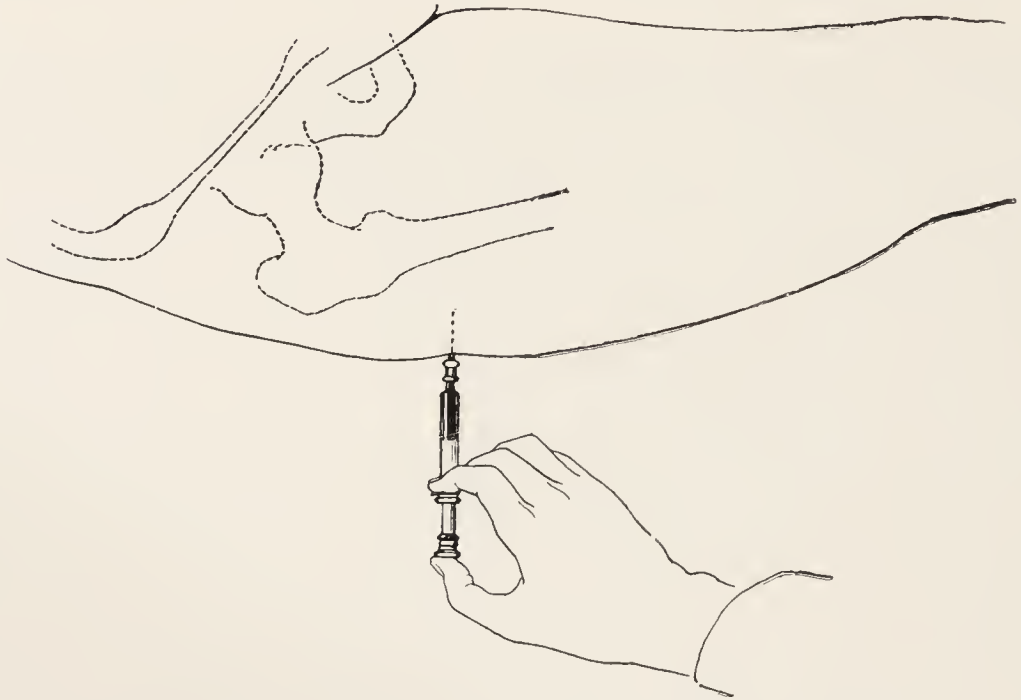


Fig. 76.—Giving ergot intramuscularly. The needle, $\frac{7}{8}$ inch long, goes perpendicularly deep into outer muscle of thigh. Magnesium sulphate injections are made deep in the gluteus muscle.

deltoid muscle) for its quick action. The pituitrin causes a rapid, strong contraction of the uterus which the slowly acting ergot reinforces and prolongs.

After the placenta and membranes are removed the physician inspects the vagina and vulva to discover the presence and extent of the lacerations of the birth-canal. If none are found, soiled towels are taken away and a clean sheet spread under the patient. The hand guards the uterus, resting lightly on it, not massaging or pressing it down, but noting the same points as before. The physician usually does this, but the nurse may have to do it. A short period of rest is given the woman, then the blood-stains are

washed off, using cool sterile water unless the room be cold, when warm water should be used. Great care should be taken not to rub, hurt, or infect the vulva. A sterile pad is placed against it or under it to catch the discharges. The bed is now dressed.

The confinement jacket is removed, and a clean plain nightgown is put on. The abdominal binder is now applied. This is broad, going from the ensiform to the hips, and is pinned from above downward, the vulva pad being held in place by a very loose perineal strap. It is illusory to try to exert pressure on the uterus by inserting a roll under the binder.

During these manipulations the patient must not be roughly tossed about. Whenever the parturient is turned or lifted, one hand must be on the uterus, seeing that it is hard, and the legs must be tightly closed together. This precaution is to prevent air from being drawn into the vagina and thence into the large veins of the uterus, thus causing air-embolism, which is usually fatal; this is an important warning.

The postpartum chill is rare nowadays, because of better aseptic technic, but the patient is tired and shivery. A warm blanket, a hot-water bag at the feet, and a hot drink are given.

PERINEORRHAPHY

If a perineorrhaphy must be done, or, as the woman may express it, if it is necessary to "put in stitches," the plan of procedure must be altered. While waiting for the placenta the nurse prepares for the operation. The necessary instruments are:

Three pairs scissors.

Three tissue forceps.

Two Allis forceps.

Four short artery forceps, two 8-inch forceps.

Two needle-holders.

Six curved needles.

Three vaginal retractors, two large and one small.

Two vulsellum forceps and two cervix forceps.

Long uterine packing forceps.

Catheter and, if local anesthesia is to be used, syringes, needles, and procain. (See p. 198.)

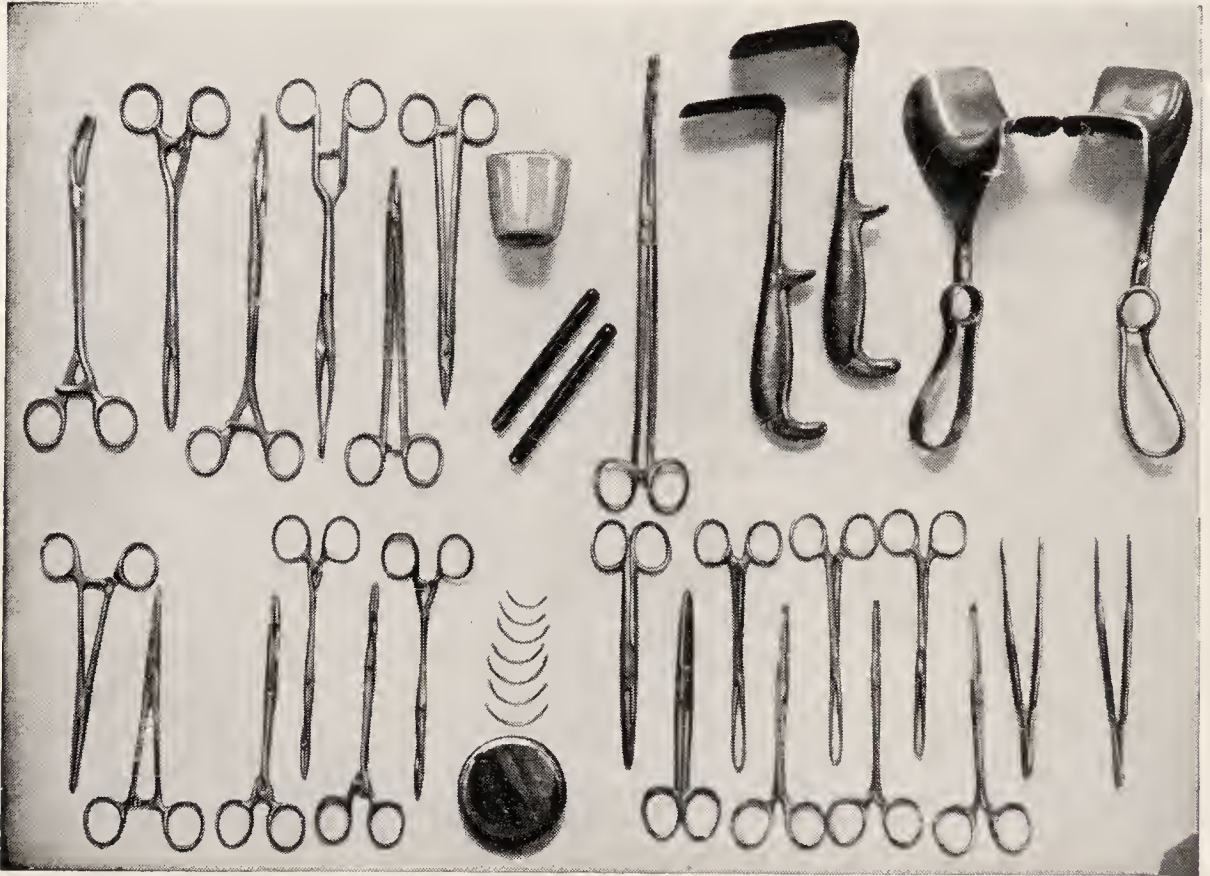


Fig. 77.—List of instruments for perineorrhaphy: Two cord clamps; two pair scissors; one uterine packing forceps; one medicine-glass for iodine or mercurochrome; three vaginal retractors—one large, one medium, one small; two tissue forceps without teeth; four Allis forceps; four artery forceps; two needle-holders; four curved trocar point needles; two cervix (ring) forceps; catheter, and if douche is ordered, a uterine douche point; catgut No. 2, 20-day; catgut No. 2, 40-day; eight strands of silkworm-gut.

Suture material is usually catgut and silkworm-gut, which may be boiled with the instruments unless already sterilized.

The nurse refills the basins with hot solutions, sees that there is a good supply of pledgets, preferably gauze, and that the light is good. Things are arranged as in Fig. 112.

After the placenta is out the patient is slowly moved across the bed, or—and the writer heartily recommends this—she is put on a table, and the basins, instruments, etc., arranged as for a major operation. Too many women refer lifelong invalidism to the neglect of proper repair of injuries of the pelvic floor, and one should not spare any effort to secure primary union of such lacerations. It goes without saying that better results may be obtained when the accoucheur has his work comfortably arranged than when he must operate over a low bed in a strained attitude, where it is difficult to carry out the demands of an aseptic technic.

In the absence of sufficient trained assistance the husband or a courageous woman may be asked to hold the patient's legs; or the sheet-sling (see Fig. 116) may be used. An anesthetic is not always necessary, many women being able to stand the pain, and further, the parts are less sensitive at this time, as they have been benumbed by the stretching caused by the child. When the operation is completed the nurse should ask the physician to catheterize the patient, and at the same time show her where the urethral orifice is, as sometimes the bruising and tearing caused by the delivery make it so swollen that she is unable to recognize it by the usual landmarks.

Lacerations of the perineum are of three degrees: first, through the fourchet; second, to but not through the sphincter of the anus; and the third degree, through the anus into the rectum. The last form is a very serious accident, as the patient loses control of the bowel unless repair can be successfully made.

Some physicians prefer to put the sutures in place while waiting for the placenta to separate and be delivered, and tie the knots after this bulky organ is out. Others believe that a better repair can be made on the fifth day or even later. All, however, agree on the necessity of repair.

There is a popular notion that when a woman acquires a laceration of the perineum during labor it is the physician's fault. While it is true that by a proper conduct of labor many lacerations and nearly all serious ones can be avoided, still it is also true that sometimes the perineum will tear like wet blotting-paper, or it will become overstretched, and no skill can save it. In communities where the above notion is prevalent the physician is often tempted to neglect the repair of lacerations of the perineum, as he will acquire a reputation of "tearing his women." His neighbor does not have lacerations because he does not put in so many "stitches." The nurse may do much to assist the conscientious physician by explaining to the family the frequency of injuries to the cervix and pelvic floor and the necessity for their repair. Good obstetrics is thus furthered.

When the mother is in bed and made comfortable, the room is aired and darkened a little, and ordered neatly, so that the patient may obtain some well-earned rest. Temperature, pulse, and respiration are taken and recorded, and a warm drink is given unless patient is anesthetized.

SUMMARY OF DUTIES: THIRD STAGE

1. Protecting mother and baby from infection.
2. Helping doctor with first care of baby.
3. Guarding uterus (if asked).
4. Identifying child (hospitals).
5. Preventing blindness.
6. Watching for and treating complications.
7. Preparing for perineorrhaphy.

THE FIRST CARE OF THE NEWBORN CHILD

The nurse assures herself that the mother is in good condition, that the uterus is firm, and that there is no hemorrhage from the vulva. She then takes the infant,

after arranging all her material for oiling and dressing it, near the radiator or fire, away from a strong light or draft, and weighs and measures it.

The Prevention of Blindness.—(See p. 466.) Some physicians clean the eyelids and put antiseptic drops into the eyes as soon as the head is born; others wipe the eyelids at this time and use the antiseptic later, just before the child is weighed and measured. Credé's method consists of dropping 1 minim of a 2 per cent nitrate of silver solution into each eye and neutralizing it at once with salt solution. It has been found that a 1 per cent solution, not neutralized, is better and sufficient protection against the invasion of the gonococcus. Unless the silver solution is made fresh every day or so, severe "nitrate reactions" of the conjunctiva may result. Lately, 10 per cent solution of protargol, or 25 per cent argyrol, is being used for the prevention of ophthalmia neonatorum.

General Care.—The nurse should never forget two facts about the baby—it is very easily chilled, and second, it is a ready prey to the hosts of bacteria that attack it upon entrance into the world. The infant is oiled all over with sterile warm olive oil, albolene, or benzoinated lard, great care being taken that the hand does not rub anything into the eyes or on to the navel. The vernix caseosa is thus softened and dissolved. Use the oil freely, especially in the groins and armpits, where the vernix gathers, and wipe the child dry with a warmed soft towel. Do this quickly, and keep the infant covered as much as possible. The child may be held on the lap or placed on a pillow on a table. The room should be warm, because it is always colder than the comfortable nest from which the infant has come. Furthermore, the baby has suffered no little shock in its passage.

After this the hands are sterilized and the umbilical cord stump is dressed, if not already done at delivery. First

the stump and adjacent skin are washed thoroughly with pure alcohol, painted with tincture of iodine or 4 per cent mercurochrome then wrapped in dry, sterile gauze; then the sterile binder is applied. The baby's temperature is now taken, after which the child is quickly dressed and put in a warm crib on either side, with the head low and face free.



Fig. 78.—Head cap to hold dressing on scalp wound.

The infant, especially if it is premature or if it was delivered by a hard operation and was more or less asphyxiated, must be watched carefully until it is known to have a good hold on life. Often it secretes large amounts of mucus. This mucus may be sucked into the lungs and cause atelectasis (incomplete unfolding of the lungs) pneumonia, and sepsis. Sometimes such infants are found dead in their cribs from suffocation.

The child's color should be pink or red, its cry should be vigorous, and if it sleeps, it should be calm, and not grunt or whine with each expiration. If there is a rattling in the throat, the nurse should wipe the mucus out with the little finger covered with a soft cloth—gently, so as not to scratch the mouth, or with a rubber-gloved finger. The infant



Fig. 79.—Nurse making foot-print records, the method introduced by the author in 1915. The importance of the identification of babies in maternities cannot be exaggerated. "Mixing of the babies" is a real peril and reliance should not be placed on a single method of marking the infants.

may be suspended by the feet for a few minutes to allow the mucus to run out, and when replaced in the crib should be put on the side with the head lower than the chest and supported by a small pillow. Sometimes a sip of water given to the child carries the mucus down with it. The infant usually needs a hot-water bag, even in the summer. It should not be needful to admonish the nurse that the bag be water-tight and not hot enough to burn.

If the infant has been hurt by the forceps, the wounds are disinfected with tincture of iodine or 4 per cent mercuriochrome and dressed aseptically. Head dressings are held in place by a tight-fitting lace cap (Fig. 78).

The Chicago Lying-in Hospital Method of Identification (Figs. 79, 80).—We have tried all the methods of identification of newborn babies that have been published and find

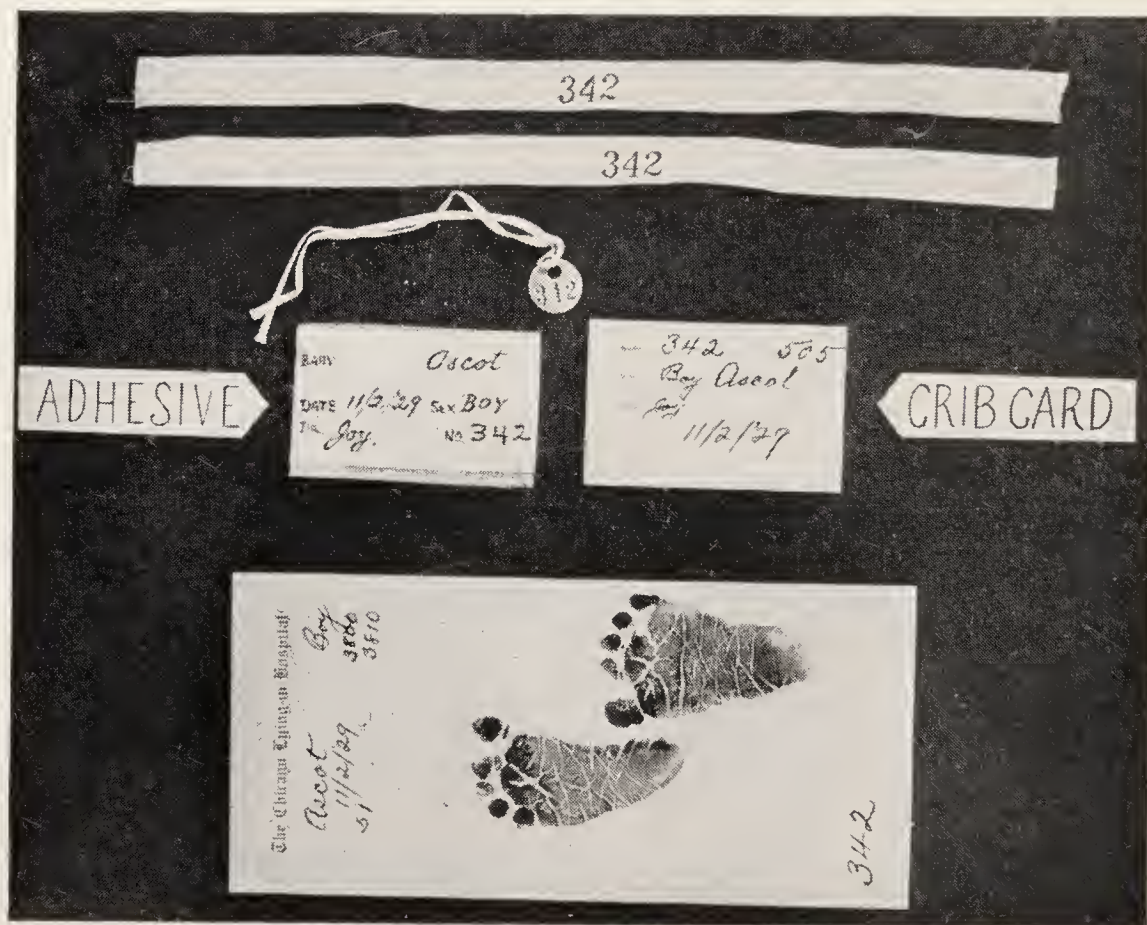


Fig. 80.—Identification method of the Chicago Lying-in Hospital. Above: Tape for mother's wrist. Tape for baby's wrist. Adhesive label for baby's back. Crib card (for nursery). Aluminum tag and tape (sterile) for umbilical cord tie. Foot print copy for mother.

that no single one is safe. The technic now employed is complicated, but it will, automatically, correct human errors, which are bound to occur. When 15 babies will come in a single night it is needful to have a perfect identification system. Figure 80 shows the materials needed. The tape with which the umbilical cord is tied carries a small aluminum numbered disk. Two tapes bearing the

same number are provided, one for the mother's and one for the baby's wrist. A square of adhesive plaster with printed blanks for the doctor's name, the baby's surname, sex, and wrist-navel number, is held ready on the receiving basket.

Sometime during labor the mother's finger prints are obtained on a permanent record.

As soon as the baby is born the nurse ties the tape on its wrist, calling the number out loud. The same thing is done with the tape for the mother's wrist. When the doctor ties the umbilical cord he announces in a loud voice the number on the tag. Of course, these three numbers must correspond and any discrepancy will be discovered at once. The name of the expected baby and of the doctor are already on the adhesive plaster, but before the child is taken out to be weighed its sex and wrist-navel number are written on it and it is securely fastened on the back. After the baby's oil rub and measurements its foot prints are taken on the mother's labor record—kept in the hospital. A copy of the foot prints is made on a neat slip of paper, together with the name, weight, wrist-navel number, and sex of the child. This is given to the mother and can be framed or pasted in the baby book.

After the baby arrives at the nursery its basket card is filled out. When the umbilical cord drops off the tag is thrown away or presented to the mother, but first the nurse compares the number it bears with that on the two wrist tapes. Should any irregularity occur in this system it is at once detected, and by going back over the whole chain the identification can be made positive.

TECHNIC IN THE SPECIALIZED MATERNITY

As above described the technic is carried out in the home of the patient, where the majority of births still take place. In the lying-in hospital, however, a special delivery room technic is rapidly becoming standardized.

In all essentials it is similar to that used in laparotomies. The nurse is "scrubbed up" to hand instruments; the

interns likewise are prepared to assist in the delivery. The bed is dressed with sterile sheets; the legs are covered with sterile leggings securely pinned; the abdomen is covered with a sterile towel. All assistants wear head and mouth and nose covers, the patient, too, and also the head nurse, who gives instructions to the junior nurses (Fig. 81).

There is one essential difference, however, between obstetric and surgical cases, and it cannot be too much nor too frequently emphasized. At the confinement case it is much harder to keep the field absolutely sterile. First, the field is very much larger than at a laparotomy, for example; second, it is exposed for a longer time, as long as four hours occasionally; third, the patient, not being sound asleep, is likely to disarrange the sterile coverings or put her hands on them; fourth, she may cough or spit on them (therefore the mouth cover), and fifth, the field is often soiled by feces, urine, liquor amnii, etc., etc.

It requires, therefore, much linen, frequent changes, and constant watchfulness on the part of the nurse and others to prevent breaks in the aseptic technic.

As applied to hospital and to home practice the general principles of obstetric care, already elaborated, are the same.

The reader may be interested in comparing a labor in Egypt, 1500 years B. C. (Fig. 82), with one of modern times (Fig. 81).

The first description of a labor, taken from the Papyrus Westcar, dated four thousand years ago, about seven hundred years before the reign of Tut-Ankh-Amen, is that of Red-dedet. She was pregnant with triplets by the Sungod Râ, and felt labor-pains. King Râ despatched the goddesses Isis, Nephthys, Meschent, Hekt, and Chnum to her aid. They took the form of musicians and Chnum carried the obstetric satchel. After closing the door Isis stood in front of the parturient, Nephthys behind her, and Hekt assisted at the birth of the first baby. They washed it, cut the cord, and put it on a bed of bricks. This process

was repeated three times. The goddesses received as pay a jar of barley and departed.



Fig. 81.—Arrangements for delivery in a maternity. Shows the sterile field. The stethoscope on the physician's head enables him to listen to the fetal heart tones unassisted, without infecting his gloves.



Fig. 82.—A labor in ancient Egypt. Bas relief from the Temple of Hermonthis (from Ploss).

The nurse will note that the diagnosis of triplets was made before delivery, that the baby was washed before the cord was cut and the baby laid on bricks—evidently a

sort of incubator, as in ancient Egypt they hatched chickens in boxes warmed by hot bricks. Triplets are usually prematurely born.

CARE AFTER THE THIRD STAGE

While the nurse is attending to the infant she should look after the mother a little also, noting her color, restfulness, the rapidity and strength of the pulse, the firmness of the uterus, and the amount of bloody discharge. If the uterus relaxes, the constriction of the blood-vessels in the placental site is released and bleeding results. She must early detect a hemorrhage if one occurs, and determine if the patient is in good condition and not shocked, which is done by observing the above symptoms.

The normal flow of blood from the genitals in the first two hours after delivery will not exceed 2 ounces, and there will be no clots. If there is more discharge, the nurse should massage the uterus and give 1 dram of ergot. The puerpera should lie on the back for three hours after delivery, after which she may be turned on her side, supported by a pillow at the back. If the uterus has been packed with gauze, the nurse is to support the abdomen carefully while moving the woman, since brusque motion may tear the uterine muscle over the packing.

Headache is a very important symptom during and after labor. It should always be reported to the physician. An examination of the urine for albumin, and of the patient for other signs of impending eclampsia, *e. g.*, blood-pressure, will be made.

Soiled towels, sheets, etc., are gathered together and put to soak in cold water. The linen soiled with fecal matter should be soaked separately, and those articles that are very bloody should be rinsed out before being put with the rest. After soaking in several changes of cold water and thorough rinsing, they may be sent to the laundry. Hot water should not be used on bloody clothes, as the heat

coagulates the blood in the mesh and thus permanent stains are left. Towels wet with bichlorid should also be well rinsed before being boiled, as the mercury stains cannot be removed. Cotton sponges and the placenta must not be thrown into the water-closet. They clog the pipes.

One of the duties of the attendant at this time is the filling out of a birth certificate. The birth of every viable child must be registered in the state archives.

Delivery before the doctor arrives and those complications which the nurse may meet when alone on the case are discussed on p. 368.

ANESTHESIA IN LABOR

Theocritus (300 B. C.) mentions the administration of narcotic potions to the woman in labor, and all through the ages and in all climes some attempt has been made to relieve her sufferings. In 1847 Sir James Y. Simpson, of Edinburgh, used ether for an obstetric operation, soon afterward he introduced chloroform, which he recommended for even normal delivery. A storm of protest from physicians and laymen broke loose against the latter practice, and it was not until it became known that Queen Victoria, in 1853, with her seventh child, enjoyed the benefits of chloroform that its use was generally accepted. It is therefore called the Queen's chloroform, or *anesthesia à la reine*.

Obstetric anesthesia must be sharply distinguished from surgical. One is temporary, intermittent, during the labor-pains, and deep only for the few minutes of the actual birth of the head; the other is identical with that used in operations, with complete unconsciousness and muscular relaxation. Since a discussion of surgical anesthesia is out of place here, the nurse is referred to appropriate text-books.

One word may be permitted. When a patient lies on the table ready to submit his person and his whole personality

to the surgeon, he is overwhelmed with a flood of emotions, the nature of which will depend on his temperament, his religious upbringing, and his strength of character. We

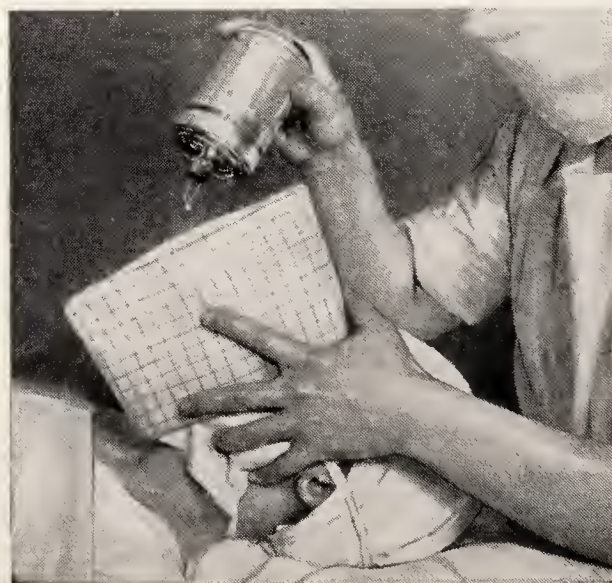
*A**B*

Fig. 83.—*A*, Giving ether, open method. A bent safety-pin is put through the tin cap of the can to make a dropper. *B*, Giving ether, closed method. Cone made of paper covered with a towel.

cannot discuss these feelings here, but, no matter what else they may be, one is constant, whether it is confessed or not—in the man as well as the woman—he feels he is about to enter the valley of the shadow. With what other

emotions will a young mother ascend the delivery table to meet a mysterious ordeal to which she has looked forward for months with growing anxiety and dread! The comfort conveyed by a quiet encouraging word, or the pressure of a human hand cannot be fully appreciated except by one who has been in the situation herself. Psychologists tell us that the mind is most amenable to suggestion in the twilight state between waking and sleeping. It would be well if the accoucheur could speak words of cheer to each patient, and as she goes under the anesthetic leave the thought in her mind of a successful outcome. Here is the nurse's opportunity also. The same state of suggestibility exists when the woman awakes, and at this time the nurse may impart to her the idea of a successful operation and a speedy recovery.

Obstetric anesthesia, a general term applying to several methods, is produced by ether, chloroform, nitrous oxid and oxygen, morphin-scopolamin, ethylene, etc. Sometimes only analgesia, unconsciousness of pain, is induced, the patient being partly awake.

Scopolamin and morphin, pantopon, chloral, amytal, and other drugs are used to alleviate the suffering of the first stage. If the nurse is not familiar with the physiologic action of these remedies she should ask the physician what effects she should look for and report.

Ether.—One may begin the use of ether at the end of the first stage when the head is passing through the cervical ring, causing intense sharp cutting pains, and it may be continued intermittently throughout the second stage. Although there is danger of relaxation of the uterus and postpartum hemorrhage from too long administration, in pituitrin and ergot hypodermically we now have means of counteracting these evil effects. A cone or an open inhaler may be used (see Fig. 83, A). The author prefers the latter. At the very beginning of a pain or when the nurse, sitting beside her patient, feels that the uterus begins

to harden, a dram of ether is poured on the mask, this is placed over the face of the patient and she is told to take several deep breaths. This process is repeated with each pain. If the doctor wishes to restrain the too rapid progress of the child, the nurse will drop the ether on the mask continuously, a drop a second, spreading it evenly over the cloth. To obtain greater concentration of the vapor a towel may be wrapped around the inhaler. As soon as a light anesthesia is obtained, the mask is removed and the nurse awaits further instructions. During the delivery of the head the doctor will ask the nurse to "crowd the anesthetic," which means that she will pour the ether in a tiny stream almost continuously, withdrawing the mask the moment the head is born. At no time may the patient become cyanotic, or be completely relaxed, or have stertorous respiration, or a very rapid pulse, or dilated pupils—all danger signals of too much anesthetic.

Chloroform.—Many physicians prefer this to ether because it is easier to carry and it is pleasanter to take, quicker in action and in recovery, and there is less nausea afterward. It is, however, not quite as safe as ether, certainly not when pushed to the surgical degree. It is administered like ether, but may not be begun as early, because of its paralyzing effects on the uterus and its degenerative influences on the liver and the blood of both mother and baby. For the latter reason it may not be given to toxemics.

The small inhaler covered with one thickness of cotton flannel is used, in order to provide a very free admixture of air. When the pain begins, 15 to 20 drops are poured on the cloth and the patient told to breathe naturally, *not to take deep breaths*. If the pain is long, a few more drops are used, the mask being removed when it is over. When the child is about to be born the administration is more continuous, but the anesthesia is never as deep as with ether.

For both ether and chloroform the eyes should be covered with a moist handkerchief and the face smeared with vaselin to prevent burns (Fig. 84).



Fig. 84.—Giving chloroform. Note the free admixture of air.

NITROUS OXID AND OXYGEN ANESTHESIA

Since 1878 nitrous oxid gas has been occasionally recommended for obstetric practice. Experience has shown that during pregnancy it may be used for the extraction of teeth with safety, because the short stage of asphyxia does not injure the child. Recently, since the dentists have demonstrated that, mixed with oxygen, nitrous oxid can be made to produce analgesia and even anesthesia with but little hypercarbonization of the blood, the surgeons have begun to use the combination for prolonged operative procedures. In the last few years the mixed gases have been employed in obstetrics.

The administration is not simple, and a good mixing apparatus is needed. It is begun as the second stage of labor draws near. The gas is given with a large inhaler and the method is similar to that of ether. Just as the pain begins the patient is instructed to take three deep breaths of the mixture—90 per cent nitrous oxid gas and 10 per

cent oxygen. Then more oxygen is given—40, 50, 60 per cent—and, as the pain disappears, pure oxygen; when the pain is gone the inhaler is removed. The patient is fully conscious, perhaps a little dizzy, but feels nothing. Unconsciousness means that too much gas has been given; also cyanosis, which must be at all times avoided. Thirst is a prominent symptom and water may be allowed. The woman bears down with the pains as usual. The labor is conducted as with ether anesthesia, but the heart tones of the fetus require careful watching. If they should be weak or slow, more oxygen should be put in the mixture or ether substituted for the nitrous oxid gas. After the delivery the administration is stopped, but may be begun again for perineorrhaphy, removal of the placenta, etc. Sometimes forceps and version are done under this form of anesthesia, but for these the author prefers ether.

After using the apparatus the inhaler is thoroughly disinfected with 2 per cent lysol solution. The gas cocks must be tightly closed to prevent waste—the gases are expensive. The apparatus and tanks must be kept in a cool dark room.

ETHYLENE

Ethylene is the latest anesthetic. It is a gas and is used, like nitrous oxid, combined with oxygen, for both short and prolonged operations. It smells like garlic and is inflammable, numerous explosions being reported. These result from ignition by an exposed cautery or electric switch, or from natural static electric sparks firing the ethylene when it has been mixed with air in an explosive proportion. Various devices are employed to get rid of this danger, such as abstention from the use of fire during operations and care with electric switches. To render “static” harmless, electric grounding to the water-pipes—of the patient, the tables, the floor on which the operator and nurses stand, the gas machine, etc., has been recom-

mended. It is also advisable not to change tanks during the administration and to empty the gas bag carefully after it. Do not mix ethylene and nitrous oxide!

The method of administration is similar to that of nitrous oxid. In both cases the technic is complicated and delicate and must be learned by practice under an expert.

In Germany acetylene is being used under the trade name Narcylen. It is like ethylene.

GWATHMEY'S SYNERGISTIC ANALGESIA

Dr. J. T. Gwathmey has developed at the New York Lying-in Hospital a method of analgesia to which he gave the name synergistic, because it combines the narcotic and analgesic action of several drugs, morphin, magnesium sulphate, ether, and alcohol. A small amount of quinin is added to counteract the paralyzant action of the drugs upon the uterine contractions. Part of the medication is given hypodermically and part by rectal instillation. We have used this technic with great satisfaction. While it is not uniformly successful in abolishing the pain of labor, and such is not the intention, most patients are much relieved and no harmful effects have as yet been reported. Contraindications to its use are colitis, diabetes, and diseases of the ear. We do not use the rectal instillations unless the hypodermics are insufficient. Dr. Gwathmey has kindly permitted me to reprint his own description.

Ampules containing morphin and magnesium sulphate, magnesium sulphate plain, and the drugs for rectal instillation, already mixed, are now obtainable, but any nurse can prepare the medicines herself from the medicine closet. The rectal instillation requires care to make a smooth mixture; dissolve the quinin in the alcohol, add the ether, then the olive oil—shake well and filter through cotton. Cork tightly, keep at room temperature. Prepare two doses for each labor, the second one containing only 10 grains of quinin.

“When cervix is two fingers (1 inch) dilated, with pains three to five minutes apart and, lasting thirty or more seconds, give (1) intramuscular injection of 2 cc. sterile 50 per cent solution of magnesium sulphate and $\frac{1}{4}$ grain morphin sulphate. If sedation, wait until effect begins to wear off, or, if no relief within twenty minutes, repeat (2) intramuscular injection without morphin, and give by rectum the following instillation:

Quinin alkaloid.....	20	grains
Alcohol.....	45	minims
Ether.....	2½	ounces
Petrolatum liq. heavy (or olive oil) q. s. ad	4	“

“Twenty minutes after rectal instillation, give (3) intramuscular injection of 2 cc. sterile 50 per cent solution magnesium sulphate (no morphin). *The Standard Treatment is three (3) intramuscular injections and one (1) instillation.* If labor is prolonged beyond four hours from first injection, the entire technic can be repeated with safety, except that the morphin is omitted when delivery is expected within one hour.

“Apparatus: Five-ounce funnel; 20 inches rubber tubing, glass connection; French catheter, size 20 or 22; hypodermic needle, long ($1\frac{1}{2}$ inches); a container for 2 extra ounces petrolatum liq.

“*Details of Technic.*—1. When labor begins, give one soapsuds enema, then tap-water enemas until bowel is clean. Patient should walk to toilet when possible. Repeat tap-water enemas every eight hours. If practical, a rest of at least four hours should intervene before treatment. Catheterize if necessary.

“2. Cleanse the site of hypodermic injection thoroughly with iodine and alcohol, and be sure the needle and syringe are absolutely sterile. Sterilize the outside of the ampules with alcohol. If the ampule *with* morphin is not at hand, dissolve the morphin tablet separately in a small amount

of water and sterilize before it is drawn into the syringe containing the magnesium sulphate. State to patient that object of injection is to relieve pain.

"Give the intramuscular injection during a contraction. Insert a long needle deep into the gluteal, deltoid, or subscapular region and inject solution as needle is gradually withdrawn. Avoid injecting solution into skin and subcutaneous tissues. It causes abscesses.

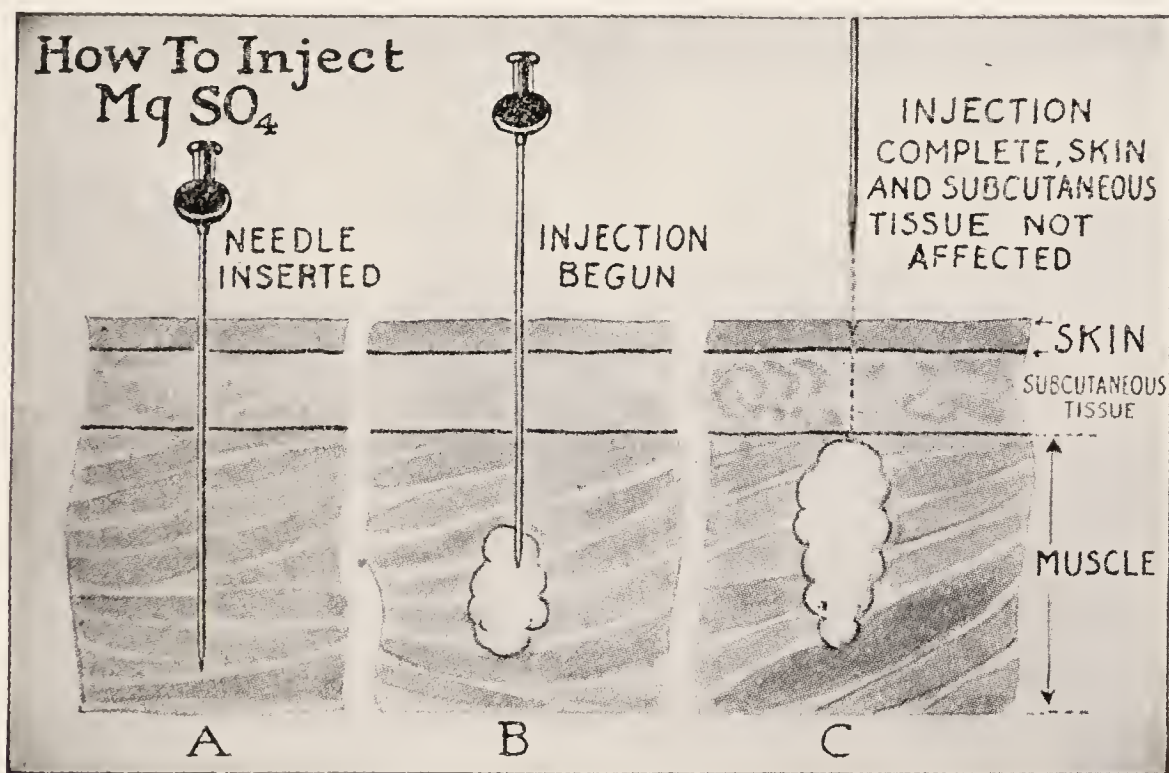


Fig. 85.—Method of giving intramuscular injection (Gwathmey).

"Keep patient as quiet as possible. Place cotton in ears and cover eyes with some dark colored material, or with towel. If in a ward, the bed should be screened; if in a room, lower the shade, exclude light, and close door. Give only necessary attention, talking in a quiet voice and making all manipulations as gently as possible. Note time of intramuscular injection and fill out analgesic chart as labor progresses.

"3. Just before giving rectal instillation, state that object is to relieve pain. Place patient on left side, Sims' position. Apply vaselin (or oil) liberally around anus so that the ether, if expelled, will not burn. Fill catheter and rubber

tubing to funnel with warm oil in order to exclude air. Insert gloved finger into rectum and direct catheter about 8 inches, *i. e.*, beyond fetal head (or buttocks). Lower funnel below level of anus and allow oil to return to funnel together with any gas that may be left. If unusual amount of fecal matter or water is present, allow it to drain away and refill with 1 ounce of oil, care being taken to exclude air. Now elevate funnel. As last of oil is leaving funnel, add mixture (which has been allowed to stand in warm water for a few minutes), care being taken not to admit air between oil in tube and mixture in funnel. *Finally add a sufficient amount of oil at 100 F. to make a 5- or 6-ounce mixture.* Between contractions, under gentle pressure, pass the fluid by "milking" the rubber tube. Give the whole amount between three to five contractions. Clamp the catheter below glass connection so that no air can follow and then withdraw catheter. Make pressure on perineum with a towel for ten to fifteen minutes during contractions. Instruct the patient to breathe deeply, with mouth open during contractions and to "squeeze up" in order to induce reverse peristalsis. State that if contents are retained, there will be no pain, and thus secure co-operation. From now on the patient may be allowed to lie in the position most comfortable to her. Do not make a rectal or vaginal examination within one hour after instillation.

"4. Twenty minutes after instillation give third intramuscular injection of magnesium sulphate.

"5. A second or even a third instillation may be given at two and a half-hour intervals, using only 10 grains of quinin, however.

"6. If an anesthetic is required when head is passing over perineum, use sparingly. No chloroform. To superimpose an anesthetic upon a partially analgized patient is dangerous for the child." (Very important J. B. D.)

Newer Analgesics.—The invention of veronal was the beginning of a succession of barbituric acid preparations—

allonal, barbital, neonal, ipral, dial, luminal, nembutal, amytal, pernocton, etc., and they are being given a very thorough practical test, used by mouth, per rectum, by hypo, and intravenously.

Experience shows that much relief from pain and the memory of pain is obtainable from these compounds but they all have one disadvantage—they often cause unruliness, sometimes even maniacal excitement, which has to be calmed with morphin. The nurse therefore must be on the lookout for such untoward effects and occasionally for cardiac and respiratory embarrassment.

Another preparation, avertin, given per rectum only, is having a present, perhaps passing vogue. Extraordinary precautions being required, the doctor usually prepares and administers it himself.

SCOPOLAMIN-MORPHIN ANALGESIA

Nowadays but little is heard of “twilight sleep” about which there was so much magazine publicity just before the war. Obstetricians use morphin and scopolamin in labor now as we have done for twenty-eight years, but the method as elaborated in Freiburg is practiced in but few hospitals.

By giving a moderate dose of morphin ($\frac{1}{6}$ to $\frac{1}{4}$ grain) early in labor and repeated small doses of scopolamin ($\frac{1}{200}$ to $\frac{1}{150}$ grain) every one to three hours, *i. e.*, just enough narcotic to keep the parturient in a hazy borderland of forgetfulness, many cases of labor can be terminated without the woman retaining a painful memory of the experience. If the nurse is interested in this method of painless labor she may consult one of the earlier editions of this book—the fourth or fifth. The difficulty of carrying out the details necessary for success, the required constant presence of the accoucheur, and the slight but unavoidable fetal mortality rendered “twilight sleep” unpopular.

Local anesthesia is being used more and more in obstetric practice. It is the safest of all anesthetics, and since the solutions are now obtainable in sterile ampules, we do not have to do without it in home deliveries.

For episiotomy and the repair of lacerations it is injected only around the wound (infiltration) but for forceps opera-

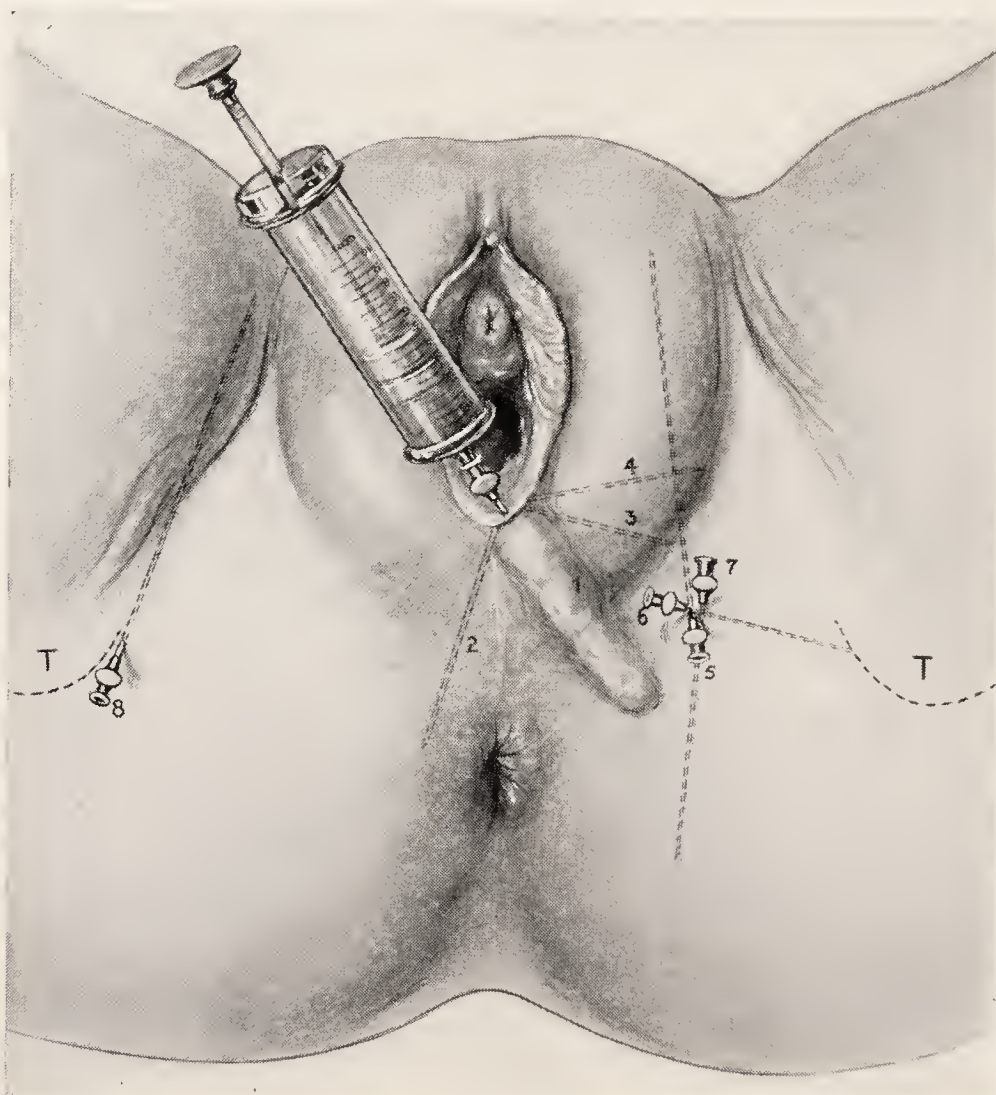


Fig. 86.—Local anesthesia. For simple episiotomy and its repair we simply infiltrate with 1 per cent procain, the line of incision. For forceps or breech delivery the pelvic nerves are blocked too.

tion the nerves must also be desensitized (nerve blocking). Figure 86 shows where the solution is injected to do this.

The nurse should provide good easy-working 10 and 20 cc. syringes, short and long (3 inches) needles and, depending on the operation, 5 ounces of 1 per cent or 10 ounces of $\frac{1}{2}$ per cent procain (novocain) solution, adding 2 drops of epinephrin ($\frac{1}{1000}$) to each ounce.

CHAPTER II

CARE DURING THE PUERPERIUM

FIRST, last, and all the time during the puerperium the nurse must consistently practice asepsis in everything that concerns the genitals and the breasts in the mother, and the eyes, nose, mouth, and navel in the child. The nurse must remember that while she is only in small part responsible for the asepsis of the labor, the major part being assumed by the physician, she is in large part responsible for the asepsis of the puerperium of both mother and baby. She dare not relax her vigilance at any period of her attendance on the case.

If the nurse will recall the physiology of the puerperium (p. 77) she will note that involution of the uterus and progression in the breasts are the most prominent local changes, and elimination of the chemical products of pregnancy and restoration of the strength of body, and mental readjustment are the outstanding features of the general condition. She will find that her duties to her charge will consist in watching these processes as they unfold before her eyes, in order to determine when they vary from the normal, and when extraneous complications threaten their orderly march; furthermore, in applying those measures which experience has shown guarantee their proper course and avert complications.

Infection is the greatest disturber and may affect all the processes of the puerperium, but occasionally abnormal function and nervous influences may be operative. A few examples of the latter may suffice: the uterus may relax and, the grip of the muscle upon the vessels in the placental site being released, hemorrhage occurs; overstimulation of

the breasts causes engorgement and caking; the shock of labor or the patient's inability to adjust her mind to the new conditions and responsibilities of life may result in an exhaustion psychosis, even a puerperal melancholia in the predisposed. In this chapter only the routine care of the normal puerpera will be given, the reader being referred to p. 387 for a study of the complications.

Immediate Care of the Puerpera.—By the time the doctor leaves the house the danger of postpartum hemorrhage is usually passed, as within a few hours the vessels in the placental site are sealed. Relaxation of the uterus, however, may occur at any time of the puerperium, even as late as six weeks, especially if clots, or membranes, or fragments of placenta remain in its cavity. Proper care of the third stage of labor usually forestalls hemorrhage, but not always, therefore the nurse will inspect the lochia for clots and bits of membrane, and by frequently palpating the uterus, decide whether it is large and soft, or small and firm, shrinking in size normally.

The puerpera usually sleeps on her back for several hours after delivery. She may now be allowed to turn on either side, the nurse supporting the uterus and keeping the limbs close together while she moves, to avoid pulling on the stitches and to prevent the admission of air to the vagina which, some authorities fear, may cause air embolism. In unconscious and unruly patients a towel may be pinned around the knees. A pad between the two knees will prevent friction. In the early days of the puerperium frequent changes of position will facilitate drainage of the lochia and better pelvic circulation.

During the first few hours and days the particular conditions for which the nurse will keep watch are: **shock** and **hemorrhage** (bleeding, or profuse discharge of blood-serum, rapid pulse, pallor, faintness); **eclampsia** (headache, increasing edema, eye symptoms, cloudy mind, anuria); **puerperal infection** (chill, fever, redness and pain

around the stitches, disordered lochial discharge, abdominal pain, etc.).

DAILY CARE OF THE MOTHER

The Breasts.—The objects of the nurse's care of the breasts are to prevent overengorgement, caking, sore and cracked nipples and mastitis, and to establish an adequate food supply for the infant.

After the mother has rested the baby is applied to the nipple (Fig. 87). Before the first nursing the breasts and



Fig. 87.—Woman in proper position for nursing an infant.

nipples are washed with soap and water and bichlorid (1 : 1000), then dried with a sterile towel. Another sterile towel is laid over the breasts and fastened to the binder with safety pins. This towel is changed once or twice a day. The nipples are not treated unless they are soiled, crusted or cracked. No further treatment is required unless the nipple is tender, when it may be anointed with sterile albolene or cocoa-butter. The fingers do not come in contact with the nipple at all; if it is necessary to do this, the hands must be disinfected, an injunction which applies to the mother

with equal force. There are many forms of breast supporters in use, but the simple straight binder with shoulder straps, if properly pinned, will give support without compression, which is all that is desired. By means of darts the muslin is formed into a hammock which hangs from the shoulders. Some physicians dispense with the binder entirely, believing that exposure of the nipples to the air prevents cracks and infection, but they insist on sterile nightgowns. Others omit the breast support, but cover the

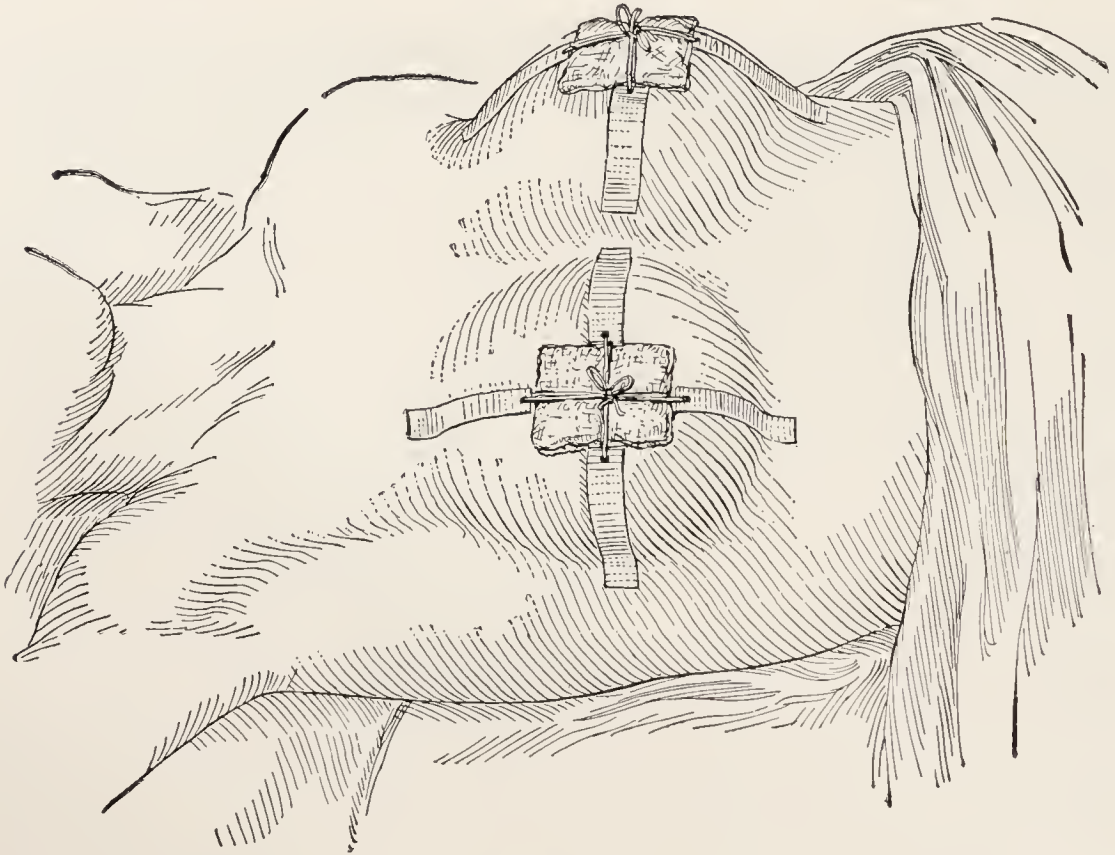


Fig. 88.—Holding the sterile dressing in place with adhesive strips.
Used only occasionally.

nipples with gauze held in place by narrow strips of adhesive (Fig. 88). Others still, support the breasts sling-like with broad adhesive straps raising them toward the shoulders. Safety pins used on the binder must be kept separate from those used on the abdominal binder—this helps to keep infection from the breasts.

If the patient has followed instructions regarding the breasts during pregnancy, there is less likelihood of trouble during the nursing period, which is another argument for

prenatal care. The nurse should, many times each day, inspect the nipples, with a magnifying glass if need be, in order to discover a crack or blister at its very beginning. Germs may enter the breasts by way of the lacteal ducts or, more readily, via the portal provided by fissures and blisters on the nipple. Early treatment, therefore, may prevent infection and consequent abscess. Simple cleanliness and avoidance of injury are more successful than



Fig. 89.—The *mammillaris*. (From a painting in Pompeii—Witkowski.) Tertullian tells us that the Roman women used a breast binder made in the temples and possessing mystic powers.

antiseptic washings. Strong astringents are not used and the baby must not be permitted to chew the nipple.

The baby is put to the breast every eight hours until the milk comes, then every four hours during the day, but not during the night. The first nursing is at 6 A. M., the last at 10.30 P. M., and the child is put to the breast once during the night if it seems really necessary. The four-hour schedule is for robust children. Those under 2700 Gms. and those that do not gain after the eighth day have a three-hour schedule: 6, 9, 12, 3, 6, the last feeding about 10 P. M.

When the milk "comes in," which usually occurs on the third day, the breasts need more support from the breast-binder. The treatment of cracks, engorgement, and other conditions of the breast will be taken up in the chapter on Complications. Too much care and too careful asepsis cannot be given the breasts, as infection, with resulting abscess and impaired nipples, with consequent necessary weaning of the child, must be avoided. A nurse may not massage or pump the breasts on her own responsibility.

Care of the Genitals.—Has the nurse ever dressed a fresh wound? Did she practice asepsis? To be sure! Then let her apply the same strict principles to the treatment of the puerperal wounds, but bearing in mind this difference: whereas the surgeon closes his incision and covers it with an occlusive dressing, the puerperal wounds are open and exposed to the attack of bacteria almost constantly. The obstetric nurse, therefore, who guards her patient from infection is entitled to greater credit.

Every four hours, and after each bowel movement and urination, the vulva is dressed. The nurse provides everything she will need close at hand; she puts the patient on a warm douche-pan and arranges the bed and its coverings neatly. Then she sterilizes her hands, or uses sterile rubber gloves, gently separates the labia, and pours, from a narrow-lipped pitcher raised 6 inches above the parts, a solution of lysol, 1 per cent, or bichlorid, 1:2000, over the parts. After this she dries the vulva with gentle pressure by means of cotton pledgets, puts on a sterile pad, and adjusts it with a T-bandage, or pins the ends of the pad to the abdominal binder. After the first day these attentions are not needed so often—only every six hours—unless there is much lochial discharge.

The binder must not be soiled or wrinkled, and the dressing must not be too tight, must be so arranged that feces—from involuntary bowel movement—cannot dam up and cause infection. The danger of displacement of the pad and

the transport of infective material from the anal region to the vagina is held so great by some obstetricians of note that they discard the vulvar pad altogether. At the Brooklyn Hospital a large absorbent sheet is kept under the buttocks, and in Heidelberg the woman is diapered like a baby.

If there are stitches in the perineum, the nurse must redouble her carefulness and not pull on the ends or knots in any of the manipulations, as in passing the bed-pan under the patient, removing the pads, etc. The physician's best work may thus be spoiled. If the patient complains of the stitches hurting her, the nurse should inspect the wound to see if they are cutting through, in all cases she should notify the doctor. Sometimes there is marked swelling of the vulva on the second day. The doctor may order warm, moist, medicated applications to the parts or an application of infra-red rays from a lamp. If left to her own devices, the nurse may apply a warm 25 per cent alcohol solution dressing to relieve the swelling and pain.

Often after several days a whitish substance forms in the creases of the vulva. This is composed of epithelial scales and dried and coagulated secretions. It may be removed by anointing the parts freely with sterile albolene. After an hour the softened and dissolved material may be gently rubbed off. The parts about the vulva need an occasional washing with soap and water. Douches are never given unless ordered.

The hands must never be soiled with lochial discharges. This is an important injunction, because these discharges are infectious, and they may infect the puerpera in the next bed, the mother's breasts, or the umbilicus or the eyes of the infant, and also the fingers of the nurse. The patient is also warned against the danger of infecting herself.

Special Care in Cases of Complete Laceration of the Perineum.—In cases where the sphincter ani has been torn and sutured the nurse will ask the physician for special

instructions regarding the diet, and the attention to the bowels, *i. e.*, cathartics and enemata.

AUTHOR'S SPECIAL PERINEORRHAPHY ORDERS

ALSO FOR THIRD DEGREE LACERATIONS

1. No enemas or rectal tubes.
 2. Do not take temperature per rectum.
 3. No cathartics until ordered by doctor.
 4. Don't touch the stitches.
 5. For the first bowel movement be sure to obtain special instructions from doctor or head nurse. The usual orders are: Evening of fourth day, ℥j liq. petrolatum; fifth and sixth days, liq. petrolatum ℥j t. i. d. p. c.; A. M. sixth day, ol. ricini ℥j; when bowels move if patient feels like straining inject ℥viiij sterile olive oil into rectum—and aid if needful with a salt solution enema. After complete (third degree) lacerations begin this schedule on the eighth day, the object of the delay being to secure strong union of sutured sphincter and imperviousness of the wound before the muscle is subjected to strain, and the perineum to the danger of infection from feces.
 6. *Diet:* No food containing woody fibers, such as fruits, lettuce, seeds, vegetables, bran, etc. These make large hard scybala, which in passing might tear open recently united surfaces.
- May Have:* Strained vegetables and cream soups, oyster stew, plain custard, gelatins and jellies (no seeds), strained gruels, milk egg-nog, grape juice strained, strained orange juice, well toasted white bread, wheat crackers, oysters, meat in small amounts, butter, sugar, candies, ice-cream, and ices. After first movement, regular diet.
- Stitches are removed the tenth or eleventh day.

Under no circumstances should the patient be allowed to strain during the evacuation. The tendency to strain is due to the presence of a hard mass of feces in the rectum. If the nurse detects such a tendency, she should forbid it, and give another warm olive oil enema to soften the mass. In passing the enema tube the point should be directed along the posterior wall of the anus and rectum—away from the stitches. After the first bowel movement the regular postpartum care of the bowels is given except on special order from the physician.

The History Sheet.—Every morning, after bowels and bladder are empty, the nurse measures the height of the fundus of the uterus from the pubis and notes it on her history sheet as follows: Fundus 6 x, meaning six finger-breadths from the pubis. The orderly recession of the uterus indicates that involution is proceeding properly, and this is one of the best safeguards against infection. Further, the nurse's scientific interest is excited by observing how nature disposes of the bulky uterus. She can follow the shrinking fundus from day to day, until it finally disappears behind the pubis. She also notes the character and amount of the lochia, as described on p. 79, and must not forget to chart and call the doctor's attention to clots, membranes, etc., expelled, and to all unusual occurrences.

The temperature, pulse, and respiration are to be recorded every six hours for four days, and then, if normal, every eight hours until the patient is discharged. A rise to 100° is the signal for the 4 hour schedule.

The condition of the perineum, of the stitches, should be a daily notation, with special mention of the presence of swelling, redness, pus, pain, etc.

The same is required for the breasts.

The action of bowels and bladder, the amount of sleep, its soundness, and unusual mental manifestations, if any, are also carefully set down.

If everything progresses smoothly, the nurse's notes on her record may be a little neglected by the attending accoucheur, but if a complication should arise, he will be grateful indeed for all the information he will find there. Therefore let the history sheet always be neatly and accurately kept until the case is discharged.

Diet.—There was an old notion that a woman after labor must be kept on a milk-and-water diet, in the fear that errors in eating would cause puerperal fever and other diseases.

This notion has some basis, although nowadays we give the puerpera a much more liberal dietary. If a healthy

person is put to bed, one must restrict his diet or he will become ill, and the same is true of a puerpera. Lack of exercise causes the organs to work less, and a quiet body needs less food. If food is given in large quantities, it is not properly oxidized or assimilated and "clogs the system" with waste matters. The excretory organs are thus given more work to do, and they are not in fit condition because of the lack of exercise.

Headache, lassitude, an odor to the skin, tympany, high-colored urine, putting on fat, even graver troubles, may be the evidences of overfeeding. There is, however, a physiologic need for more food during active milk-making, and the needs of each woman must be determined individually.

During the first eighteen hours after the labor the patient should have liquids in amounts sufficient to quench her thirst. After a few hours a cup of broth or tea and a small slice of buttered toast, a glass of milk, plain or with seltzer, may be given.

On the second day "semi-soft diet," with tea, coffee, milk, toast, cereals, oyster-stew, salt wafers, fruit juices, jello, and chocolate may be added. On the third day, after the bowels have freely moved, light general diet is given. Experience has shown that a healthy puerpera may have nearly all customary foods, less in amount because she is resting. Ice-cream and ices are allowable. Tea and coffee are given sparingly and should not be strong. Stewed fruits, as prunes, dried apples, and peaches, are given for their laxative effect.

The general principles of the dietary are to supply sufficient nourishment to the mother to quickly restore her strength, and also to improve the quality and quantity of her milk. The child obtains vitamins (protective substances) from the breast, and therefore the mother should eat freely of the foods containing them, such as milk, eggs, butter, sweet-breads, all kinds of fresh leafy vegetables, lettuce, celery, water-cress, chicory, endive, tomatoes, citrous fruits, and

cereals. Cases are on record where a six weeks' infant did not thrive until the mother took cod-liver oil which is particularly rich in fat-soluble vitamin A. Vitamin D is also necessary.

Three meals a day are served. At 10 in the morning a glass of cool milk, and at 3 in the afternoon a cup of chocolate with a wafer are given. Occasionally an egg-nog is prepared instead of the chocolate at 3 and at midnight, after the nursing, a glass of hot milk or malted milk.

Throughout the puerperium the nurse will see that the patient drinks pure water freely, to make up the loss caused by the free action of the skin and kidneys and the fluid required for making milk.

Foods to be Avoided.—Highly spiced dishes, heavy sauces, spiced sauces and dressings, are all to be restricted—they throw too much work on the kidneys, and may cause indigestion, which upsets the baby.

Certain drugs administered to the mother (arsenic, iodine, morphine, alcohol) may reappear in the milk. If a baby acts sick, the nurse should remember this.

Should the physician order the liquids restricted on account of the breasts, the nurse will leave out the milk, tea, coffee, chocolate, and fresh fruits, but give a certain amount of water.

If the patient has had eclampsia or is threatened with it, the physician may order milk and hot water as the sole articles of food. Some physicians give only water for a few days, then vegetables and fruits, with proteins later.

The Bowels.—Puerperae are almost invariably constipated. Strict attention must be given to see that the patient has at least one good alvine evacuation every day. The nurse should ask the physician what she should do, getting minute instructions, because in some hospitals and by some doctors the bowels are not moved until the fifth day, the idea being to prevent infection by the *Bacillus coli* which inhabits the bowel. The practice

of the Chicago Lying-in Hospital is as follows: Unless she is on "Special Perineorrhaphy Orders," the patient receives the morning of the second day 1 ounce of oleum ricini (castor oil) given with lemon juice and soda, or administered in soft gelatin capsules. Prepare juice of one-half lemon, 1 ounce of castor oil, $\frac{1}{4}$ teaspoonful of bicarbonate of soda. Put one-half of the juice in a drinking glass, then the oil, then the rest of the juice. At the bedside add the soda, stirring well. Let patient drink it while foaming. She may not know what she has taken. This is followed in six hours by a saline enema. Every day for the first week the patient receives a saline or milk and molasses (āā 3vj) enema, and if this does not produce a free daily evacuation, fluidextract of cascara sagrada in 15-drop doses is given thrice daily. The medicine is put in empty capsules just before it is administered. This method is better than giving a single large dose, although sometimes, administered in this manner, the baby's bowels are made loose. In this case give a single dose of 30 drops after the 10 o'clock nursing, and the effect on the child will be avoided.

In giving enemata the nurse should exercise great care to avoid injuring a sutured perineum. The tube, well lubricated, should be passed by sight, under good illumination, and pressed downward at first toward the coccyx, and then slightly upward. A long tube is not necessary. It need pass only a few inches beyond the anus.

If the breasts are too much engorged, a saline cathartic—for example, effervescent citrate of magnesia—may be given instead of the oil, cascara, or enemata, as the free, watery movements reduce the fluids in the breasts. If the nurse cannot get the patient's bowels to move properly, she should notify the physician. It is of great importance that the bowels move freely, because sometimes fever may result from their neglect. Castor oil is, in the writer's opinion, the best cathartic when administered as described. It was

known and cultivated by the Egyptians five hundred years before Christ.

The routine laxative after delivery empties, the often overloaded, lower bowel, promotes vaginal drainage (lochia, clots), induces spontaneous urination, activates the pelvic circulation and thus (I believe) helps to prevent infection. It is said also that castor oil has a detoxicating action.

The Bladder.—During labor the urethra and bladder are bruised more or less. The urethra is bent down and sometimes torn from its attachments, so that there is slight prolapse, which causes a kinking of the channel. As a result of this and the swelling from the contusion, plus the horizontal position, the patient cannot urinate. There may be a spasm of the neck of the bladder. The bladder must be emptied within six hours after labor, and at least three times daily thereafter, and if the patient cannot void urine the bladder must be catheterized. Before doing this several expedients should be tried:

1. Give patient an excess of water or hot lemonade, as much as 1 or 2 quarts.

2. Place the patient on a warm douche-pan half-full of warm water, cover her, and leave her alone.

3. Allow the water to run in the wash-stand, so that she may hear it, the patient being arranged on the bed-pan as before; nurse leaves the room.

4. Wet a large pledget of cotton with warm sterile water and put it on the pubis; the water dripping over the parts may start the flow of urine.

5. A hot fomentation over the bladder, patient on bed-pan.

6. Give the patient a bottle of smelling salts to smell.

7. Give patient an enema. When the bowels move the patient may urinate.

8. Pressure over the bladder with the hand—gently carried out.

9. Raise the patient with pillows to a half-sitting position. Some physicians allow the patient to sit up.

10. The catheter.

With these measures the nurse may use a little suggestion, and she should leave the patient alone, because some people cannot relax the sphincter of the bladder unless alone and quiet. The catheter should be used only when all other means fail, because of the great danger of causing a cystitis. Sometimes a little glycerin applied to the urethra starts the flow, and lately pituitrin has been given for the purpose but if the retention is inveterate the doctor may order a permanent catheter.

Dr. Curtis, of St. Luke's Hospital, Chicago, believes there is less danger of causing inflammation of the bladder by catheterization than comes from residual urine in the bladder, wherefore he prescribes regular use of the catheter. If a nurse has been consistently and conscientiously aseptic in her technic, and her patient nevertheless develops cystitis, the blame should not be laid on her.

Overdistention of the bladder is a common occurrence in the puerperium and sometimes the patient voids frequently, diverting suspicion from the condition. This is called *ischuria paradoxa*—or distention with overflow. The full bladder, making a soft bulging above the pubis and the upward displacement of the fundus, will be evident when the nurse inspects the abdomen—which she should do daily.

For the first 2 days the quantity of urine is to be measured as the doctor must know the activity of the kidneys. If the daily urinary output is to be determined, the nurse, when irrigating the puerpera, should know how much solution she has poured over the perineum and deduct this amount from the total quantity in the bed-pan.

Catheterization.—The tray contains: sterile towels; a basin of 1 per cent lysol solution with cotton pledgets; two sterile soft-rubber catheters (perfect ones); sterile lubri-

cating jelly (not vaselin); sterile basin for the urine, and the usual appurtenances for an irrigation. The nurse drapes the patient as for a dressing, provides a good light, sterilizes her hands, and washes off the vulva, and particularly the urethral orifice, with an antiseptic solution. This opening should be swabbed out with lysol solution, 1 per cent, with an applicator. The sterile, well lubricated rubber catheter is passed by sight, never by touch, and the urine is caught in a clean vessel, so as to note and chart its character and amount. If the bladder is greatly overdistended it is wiser to empty it in two sittings, as the patient might go into collapse, or the rush of blood into the anemic viscus might cause submucous hemorrhages. By palpating the fundus and bladder above the pubis the nurse can tell when the latter is empty.

Cases are rare when more than one catheterization is needed, but it may be necessary to draw the urine every eight hours for a few days. The physician is usually asked for permission to catheterize; at least he should be acquainted with the necessity for it, and perhaps he will prescribe a diuretic or urinary antiseptic.

Sleep.—It is highly important that the puerpera obtain sufficient actual sleep as well as rest. One of the symptoms, and perhaps a cause, of puerperal insanity is lack of sleep.

After the patient has been cared for on the completion of labor she is allowed to sleep as long as possible and the room is darkened and quieted to favor this. Subsequently the nurse must arrange the duties of the day so that the puerpera has a little nap in the afternoon and at least eight hours' good sleep at night. If the puerpera is persistently sleepless the physician should be notified.

General Treatment.—This is the same as for any bed patient as regards bathing, changing bed, and so forth. If possible, a full sponge bath is given every day, and occasionally the body should be rubbed with 30 per cent alcohol, especially the axillae. The excretory action of the skin is

augmented and there is more odor to the perspiration at this time. There should be plenty of light and fresh air in the lying-in chamber. Sun and air are not harm-



Fig. 90.—Bed exercise of the arms used throughout the puerperium, first passive, then active. Three minutes b. i. d. the first week. Five minutes t. i. d. thereafter.

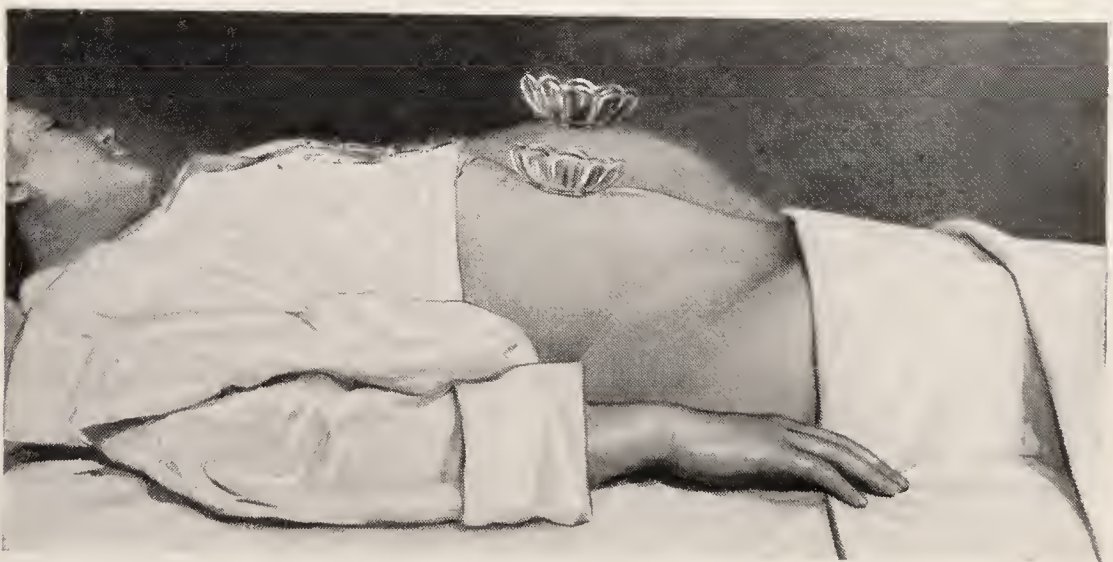


Fig. 91.—Bed exercise: Patient by deep breathing raises and lowers a little weight laid on the abdomen; after the second day, five times each morning and evening, inhaling and exhaling slowly.

ful by any means. In the olden times both were feared, and the puerpera was kept in semidarkness all the time, and all air excluded to prevent her from catching cold. It was thought that "catching cold" caused puerperal fever and mastitis, but now we know these complications are due to infection and are in high degree preventable by proper asepsis. Free ventilation and light are strong opponents to infection. The nurse, while providing both, must see that at no time either mother or child is exposed to a direct draft, and that the bright light does not fall directly on the eyes of either.

After the first week the nurse may give the patient a general light massage. She should avoid the inside of the legs, where there are veins, and the uterus and breasts. Passive motions of the arms, legs, and trunk are also sometimes recommended. These exercises while away the tedium of the bed, strengthen the muscles, especially the overstretched abdominal, thus tending to prevent "high stomach," they improve the circulation, favor involution and the action of the bowels, and hasten the return of the patient's vitality (Figs. 90-93).

Since her patient appears so normal and vigorous the nurse is apt to forget that deep changes are taking place in her system, which, under other circumstances, would be called pathologic, and thus she may neglect to study the symptoms as she would, for example, of a typhoid case, and her recording may not be done with as great thoroughness as is always desirable. The author therefore repeats the injunction never to relax in watchfulness and to observe and note how much the patient has slept, her general condition, the local conditions, breast, nipples, perineum, also her diet, enemata and bowel movements, catheterizations, the number and amount of urinations, all medicines given, the doctor's visits, and all unusual occurrences. The complications likely to occur in the late puerperium are: **infection** (p. 387); **delayed puerperal**



Fig. 92.—Bed exercise: Nurse moves the limbs thus for three minutes A. M. and P. M. At first one, then the other, then both together. In second week patient does it unaided. After perineorrhaphy wait full two weeks.



Fig. 93.—Bed exercise: After the second week the patient may do this unaided by the nurse. Not recommended before the twelfth day. Nurse holds patient's knees against bed; done six times b. i. d.

hemorrhage (p. 380); pulmonary embolism (p. 407); mastitis (p. 429); exhaustion, *i. e.*, too slow recuperation of strength; psychoses (p. 416), and subinvolution.

Visitors.—The lying-in room should be quiet and restful. The puerpera must be given opportunity to recover from the strain of labor and recuperate her strength from the exhaustion of pregnancy and delivery. Therefore only the nearest relatives are to be allowed in the lying-in chamber during the first week. Even these visits should be very short. Aside from the nervous disturbance caused by too many visitors, there is the danger of the introduction of contagion.

The Treatment of the Mind.—One of the real duties of the nurse is to provide a calm mental atmosphere in the home. The puerpera is often of a worrisome nature, especially if she is the mother of a family. She is concerned and nervous about the children, or the household, or the finances, or perhaps an erring husband. Many times the nurse, by seeing that the children have been fed and sent to school, that a basketful of mending and darning has been done, or the servants placated, has accomplished more to promote a happy and peaceful recovery of her patient than with all her other ministrations.

Most people have given but little thought to the emotions and mental conflicts of the new young mother during the first weeks after her child comes to her, but the psychiatrists know that in them we may find the origin of some of the mild psychic disturbances of the puerperium and of the real psychoses. Coincidentally with this study of the mind in cases of hyperemesis gravidarum, the author has made some fruitful observations on the normal pregnant woman's mental reactions. Here we can only touch upon this interesting subject. Let the nurse consider these facts—the long dreary waiting of pregnancy; the awe, dread, misgivings with which the mother anticipates the rapidly approaching and mysterious ordeal of labor, and which sometimes become an actual obsession that she will die before it is over; now the ordeal itself, attended with racking pain, and hemorrhage and sometimes shock; when, in normal cases, she wakes from the light obstetric anesthesia and hears her baby, her very own baby,

cry, one often sees her in a delirium of joy with outbursts of violent emotion which cannot but leave exhausting reactions, if the release of the nervous tension of the last eight months does not do so. I have occasionally thought that the woman loses a valuable experience in life if—as we so regularly do—we spare her the pain, and deprive her of the psychic exaltation and profound physical and spiritual satisfaction of the actual birth of her child.

Let the nurse also bear in mind the change in the young mother's status in the family, the adjustments she must make to her baby, her husband, and in her whole manner of living, and many of the mental symptoms which the nurse may observe during the puerperium will be explained.

After having been the center of interest throughout the many months of pregnancy, and perhaps a little spoiled by the petting of her family and friends, the new mother may, unconsciously, resent the sudden transference of attention to the baby. Indeed, she may be a little jealous of it, as was frankly confessed to me recently by one of my patients. Then, too, the realization comes that life will never be as it was before, that now she has restrictions on her freedom and her social activities, and new responsibilities which she may fear are beyond her powers.

As external evidence of these mental conflicts the nurse may occasionally observe a little peevishness or petulance, changefulness, nervousness, a desire to be alone, fits of introspection, even slight moodiness, emotional unbalance, or an inclination to prolong the semi-invalidism enjoyed during pregnancy.

The nurse who has an intelligent understanding of psychology or, indeed, only common sense and a womanly sympathy with her patient, will know how to interpret these symptoms, how to adapt herself to the varying moods of the patient's mind, and how to be of help to her by explaining away her fears and teaching her how to accommodate her powers to the tasks of motherhood.

In normal cases—*i. e.*, in the vast majority—the woman's mental adaptability (of which the psychologists speak so much) remains with her and she quickly adjusts herself to her new outlook on life, she assumes her responsibilities gladly, and bravely begins her work as mother of the child and her household.

In abnormal cases, on the other hand, in women with a weak nervous heredity, or in those pulled down by protracted labor, hemorrhage, toxemia or infection, these mental conflicts are not won by the patient. Introspection develops into moodiness, even melancholia; the illusion that the husband has transferred his affection to the child develops into jealousy which may result in her refusal to nurse it, or

compulsive acts, even attempts at infanticide; or the illusion that her husband loves her no longer may develop into a delusion of unworthiness or persecution, which may lead to attempts of suicide. And so on.

It is hard even for the psychiatrist to trace the origins of both exhaustion neuroses and real insanity—but the nurse's duties will consist in observing the patient's reactions to the calls upon her adaptability to her new life and reporting unusual mental symptoms at once to the physician. The nurse's scientific training, aided by womanly intuition and sympathy, will sooner fathom the deeper workings of the patient's mind and sense disturbing elements than the doctor during his all too short visits. Thus she can be of positive service to her charge and hasten the cure by an early diagnosis.

The Time of Getting Up.—This varies in the practice of different physicians and depends upon the strength of the woman, her freedom from fever, the height of the fundus, *i. e.*, the state of involution of the uterus, and whether or not she has had a perineal repair. While most accoucheurs allow the woman, if normal, to get out of bed on the tenth day, others allow this only in the third or fourth week. A very few physicians allow the women to get up when they feel able for it, even if it is the second day. They claim it prevents thrombosis and embolism, and favors involution. The writer believes the bed exercises accomplish these purposes with less danger. The attending physician will specify what the nurse should do in these cases. The writer's practice is to allow the woman to have the back-rest on the fifth day, to sit bolt upright on the seventh day, to get out into a rocker or Morris chair on the tenth, stand on her feet on the eleventh, have the freedom of the room on the twelfth, and go down stairs on the fifteenth day. In operative cases these acts are postponed a day or two, depending on the patient's strength, and when there are stitches, the patient should not sit straight up until they are removed.

Occasionally a patient faints upon first leaving the bed, wherefore it is wise for the nurse to have a hot or cold

drink prepared beforehand. Most puerperae overrate their powers. The nurse will graduate these first efforts to meet



Fig. 94.—Mother nursing infant when out of bed. A low rocker without arms and a low foot-stool provide an unstrained attitude. (Note the “mask of pregnancy” on patient’s face.)

each case. Usually the young mother is high spirited and eager to assume her old, but particularly her new, duties. The nurse, however, must not let her overdo, and will see

that she obtains several hours' rest in bed every day for four or five weeks after delivery.

Occasionally the lochia rubra reappear on arising from bed. In such an event a rest on the couch for a few days will bring relief. The physician is to be notified.

The first menses after labor, usually about the sixth week, are likely to be very profuse. Recovery is the rule.

The patient may take a tub-bath after the third week.

The Binder.—Ancient custom prescribes the application of a binder directly postpartum, and the author applies it, to relieve the feeling of emptiness in the abdomen, of which the women complain right after delivery, to prevent syncope, and to steady the uterus while the patient is being moved. No binder is necessary during the bed period though many women insist upon it, believing it helps to "preserve the figure" and prevent "high stomach." The belief that a tight binder forces the uterus into retroversion lacks foundation; one could hardly pin it tight enough to do that, and if it gives the patient comfort of body and mind most accoucheurs either prescribe its use or permit it. A straight or Scultetus bandage may be applied. In some hospitals the use of a sort of adhesive corset is in vogue.

When the patient gets up she may need some kind of abdominal support, and in most cases a binder or jockey strap may be worn for several weeks with comfort. Corsets may be resumed after the fourth week.

Nursing After the Patient is Up.—The breasts should be supported by a light breast-binder or supporter. The same aseptic care is practised as when the puerpera was in bed, as mastitis may come on at any time during lactation. The woman is warned about infection and instructed how to prevent it. When up the mother holds her infant as in Fig. 94 sitting on a low rocker, a shawl over her shoulders and her foot on a low stool.

SUMMARY OF TREATMENT OF A PUERPERA

1. Antisepsis and asepsis of the open genital wounds.
2. Asepsis and special care of the breasts.
3. Attention to the emunctories—bowels, urinary tract, skin (fresh air and sunshine).
4. Provisions for comfort, mental as well as physical, relief of pain, and sleep.
5. Watchfulness for complications.
6. General and special nursing care to hasten recovery.
7. Regulation of assumption of usual duties.

CHAPTER III

CARE OF THE CHILD

ALL the baby asks of the nurse is that she supply him with proper food, keep him clean and warm, and protect him from the hosts of bacteria which are ready to pounce on him the moment he enters this world. It will surprise the nurse to learn that every year many thousands of newborn babies die of infection and thousands more from nutritional and respiratory diseases—deaths largely preventable by good nursing. The nurse must continually fight infection at all its portals of entry—the navel, the mouth, the eyes, indeed the whole of the little body is nearly as vulnerable to the attacks of bacteria as a sterile culture-tube. To tell the nurse to scrub her hands before giving the baby its bath, to scrub again before she touches the navel dressing or treats the baby's eyes or mouth is a repetition of her surgical teachings and should be needless. It might be permitted, however, to remind the nurse that the newborn baby is a little adult; he is easily frightened, suffers from heat, cold, etc., as we do, he responds to loving care, and, I have often thought, he even has "feelings" which can be hurt by inconsiderate treatment.

Visitors.—None but the husband, father, and the mother or other near relative are allowed in the lying-in chamber, or to see the baby, for the first week. After this a few near friends are admitted. The nurse must be assured that no visitor is allowed to enter who has been near a contagious disease, as measles, scarlatina, diphtheria, la grippe, "cold in the head," or pus cases, carbuncles, etc. The nurse may do much by tactfully reducing the number and length of the visits. Further, the child must not be disturbed

by being exhibited to curious, if friendly, neighbors and relatives.

Bathing.—*The Steps of the Infant's Daily Bath* (by Mrs. W. Robinson, R. N.).—The new baby's first cleansing is usually done with an emollient—benzoinated lard, sterile olive oil, or albolene. After that, until the cord has dropped and the umbilicus healed, the infant is given a daily sponge-bath. This is usually done between 9 and 10 o'clock, that is, before the second morning feeding is due.

The room temperature should be 85 to 90 F., care being taken that a draft does not strike the infant's naked body.

The nurse rolls her sleeves to the elbow (to prevent scratching the baby with starched edges), and thoroughly washes her hands and arms with brush and green soap, under running water.

The infant is placed on a well-padded table and at a convenient height. Above on a shelf or on a table nearby are ready all the necessary sterile articles—applicators, cord dressings, pledgets, abdominal bands, alcohol, powders, ointments, and the clean clothes, warmed and folded in the order of dressing the baby.

Before the baby is undressed the eyes, mouth, and nose are carefully inspected, and cleansed if necessary. After this he is undressed and weighed. A new sterile paper sheet or napkin is used in the scale for each baby, first, to preserve the child from infection, and second, to avoid frightening him by the contact with cold metal.

The weight and the results of the general inspection—eyes, mouth, cord, skin, color, cry, etc.—are noted on the history sheet.

After washing the hands again the child is placed on a clean soft bath towel. The body creases, folds, and genitals are inspected, and if any vernix caseosa or smegma is found the parts are anointed with albolene and carefully wiped with a clean soft napkin. Especial attention

is directed to the detection of pemphigus, strophulus, or the lesions of syphilis.

The sponge-bath is then given, beginning with the face, which is washed with the cotton pledget, and patted dry with the towel. Use the towel as a blotter rather than a means of friction. Wipe the external ear carefully, drying well behind, but do not attempt to cleanse the auditory canal. Keep water out of the baby's eyes.

The body is then lightly sponged and quickly dried, care being taken not to touch the umbilicus with the hand or wash-cloth, since it is an open wound. Now the babe is turned on his face, the back and buttocks are cleansed with fresh water, and dried. Then a gentle general friction rub is given with the hand.

The important cord inspection is now made and for this treatment the nurse re-sterilizes her hands. If the dressing is clean and dry and there is no sign of inflammation around the cord stump, and no odor detectable, the gauze is not disturbed. Otherwise the dressing is carefully removed by soaking with 65 per cent alcohol (the wetting obviates the danger of bleeding), the wound is washed with applicators which have been dipped in alcohol, and a new sterile gauze dressing is applied. Over this the abdominal binder is sewed on. It has been suggested to change the cord dressing daily. This is not needful if the nurse understands her art and practices it.

The diaper is applied so that pressure on the genitals is avoided. The baby's other clothing is then put on and sewed. One pin is used—a large safety-pin in the diaper.

The number of the garments varies with season and temperature. All clothing is removed and applied over the feet, to avoid possible injury to the face or eyes.

If the nurse herself has a cold and during "grip" epidemics she should wear a "flu" mask while caring for the baby.

In a busy nursery the nurses find a well-padded table most convenient for giving the sponging, but in the home

she may keep the baby on her lap. Sterilized cotton is used for a wash cloth, and a sterile basin for each child must be insisted upon. After each bath the nurse must thoroughly wash her hands so as not to carry infection from one baby to another.

Ordinarily no dusting-powder is needed, but if the infant shows a tendency to chafe—that is, if there is any intertrigo—a powder of stearate of zinc should be evenly applied



Fig. 95.—Arrangements for bathing the infant. The room should be warm, not drafty, and everything required is to be handily arranged so that the bath may be given quickly and with little manipulation.

after the bath. Stearate of zinc is poisonous when inhaled. It must be kept away from young children. Much powder should not be used, and no friction is to be employed, because it rubs off the delicate epithelium. Where the skin is already eroded, no friction is at all allowable, the nurse laying the cloth on the skin and rubbing her finger over it similarly to the use of an ink-blotter. In obstinate cases the physician will prescribe an ointment. The nostrils are cleaned with cotton wrapped smoothly on a toothpick (an applicator), after softening the mucus with benzoinated lard or albolene.

Some physicians prefer the bath omitted, especially in winter, and oil rubs substituted as follows:

Daily the head and face are bathed with lukewarm water, using a little Castile soap if necessary. The but-



Fig. 96.—Proper method for holding the infant during the bath. The fingers and thumb are distributed over the head and shoulders, so that the child cannot slip out, and also when it kicks that it cannot strike its head against the sides of the tub. The thermometer may be removed after the child is immersed.

tocks when soiled are sponged with cool water. The body is gently rubbed with benzoinated lard; this is removed by means of a soft towel, which is usually all that is needed to keep the infant sweet and clean. After the cord is off and navel cicatrized the child is given a full bath.

The temperature of the bath water must always be taken with a thermometer. A hot bath should be 105 to 107 F.;

a warm bath, 96 to 98 F.; tepid, 85 to 90 F.; cool, 70 to 75 F.

Preventing Epidemics.—In hospitals, where there is danger of carrying an infection on the skin, such as pemphigus or gonorrhea, from one child to another, special precautions are necessary: First, the nurse must watch for and report at once to her superior any eruption or sore, however slight, on the infant, and note the same on her record. Second, the nurse individualizes the babies as much as possible, *i. e.*, she disinfects her hands, uses a sterile wash-cloth, a sterile basin, and jar of lard, etc., for each infant. The infant is bathed on a table covered with a fresh diaper for each bath or in its own bed. The soap is liquid and served from a bottle. Third, she isolates a child under suspicion, provides separate basin, thermometer, lard, clothes, etc., dresses it wearing rubber gloves, or delegates these duties to another. Its clothing is thrown into a 3 per cent carbolic solution before being sent to the laundry. Only by extreme care can spreading of the infection be prevented.

Care of the Navel.—The original dressing is changed whenever it is displaced or soiled by urine. See page 225. The gauze is soaked off with 1:2000 bichloride solution, washed with same or 65 per cent alcohol, and dressed again with dry sterile gauze. If the cord is moist a thorough washing with 95 per cent alcohol will improve it. No powders are used unless ordered by the physician. In this manipulation the nurse need touch the cord with only the cotton pledget or applicator. The navel is treated exactly as an open surgical wound, and the nurse should always remind herself while dressing it that many children have died from infection introduced at this portal.

The binder must be smoothly adjusted and sewed on, taking care that it is not too tight, impeding the infant's respiration. The nurse should observe and note the condition of the cord, whether it is moist or dry, whether the

line of separation is red and angry or clean and pink; whether or not there is a purulent discharge; if there be any odor—in other words, whether the navel is healing properly or not. (See Plate V, opposite p. 464.)

The falling off of the cord should be noted, and the antiseptic treatment of the wound continued until it is cicatrized and healed over. Occasionally a little bloody oozing comes from the cord or from the surface left after it separates. The doctor may prescribe the application of a little powdered alum to the spot, or a mixture of starch and alum.

The Eyes.—There are two important injunctions regarding the eyes: the first is to prevent infection from getting into them, and the second is to avoid mechanical injury, as the wiping of rough sleeves, scratching with rough clothes, or too brisk manipulations. Nearly one-quarter of all the blindness is acquired at the time of birth and the few days after it.

During the oiling or bath extreme care must be exercised to prevent fluid getting into the eyes, and this precaution must be observed throughout the puerperium. The skin of the infant may be infected with gonorrheal virus, and this, getting into the eyes, sets up severe inflammation, or “sore eyes,” which may cause blindness.

If the Credè method for preventing ophthalmia neonatorum has been used, there may be, in three to six hours, some inflammatory reaction of the eyelids, with redness, swelling, and seropurulent secretion. No alarm need be felt at this. Cold applications to the lids and a few irrigations of the conjunctival sac with normal salt solution will relieve it. If a freshly made nitrate solution is used such reactions are exceptional.

Every morning the nurse wipes the corners of the lids with a cotton applicator moist with normal saline solution, but only if dried secretion requires removal. The fingers should not touch the eyes, nor may solution be squeezed in-

to them from cotton held in the fingers—unless, of course, sterilized or gloved.

In normal cases this care is all that is needed, but should there be a continued mucopurulent discharge which glues the lids together, this must be gently soaked off with warm saline solution and the eyes irrigated with the same several times daily. Should a slight conjunctivitis resist this mild treatment, the doctor will prescribe a collyrium of sulphate of zinc, 1:5000 permanganate of potash, or similar astringent, or one of the newer preparations of silver, as protargol, or argyrol, or mercurochrome.

If on the second day or later a thin, cloudy discharge appears between the lids and runs down the cheek, and the lids become swollen and of deep red color, little flocculi of fibrinopus being seen on them, the case is serious; the physician must be notified at once by telephone, because the case is one of ophthalmia neonatorum and requires instant and vigorous treatment. (See pp. 464–469.) The nurse should never forget that, where babies are grouped together, one baby with sore eyes, even if the inflammation appears mild and harmless, may place all the rest in acute peril. It is thus that epidemics are started.

The Bowels.—Unless the meconium is thoroughly evacuated, it is a good plan to give the infant castor oil at the same time the mother takes hers—that is, on the morning of the second day. If the bowels do not move freely, this is the best cathartic for infants. The castor oil is dropped into the child's mouth from a medicine-dropper, not given from a spoon. Only in this way can one be sure the infant obtains the right dose—10 drops. Some physicians object to this plan, but the author, in an experience which covers thirty-two years and over 60,000 babies, has never seen any bad results which might be attributed to it.

The nurse should observe closely the number and character of the bowel movements, and note the same on her history sheet. The condition of the infant is read from the

bowel movements. The dark meconium sometimes resembles the black stool of melena. If a little water is added the red color of blood appears. If the infant is restless and

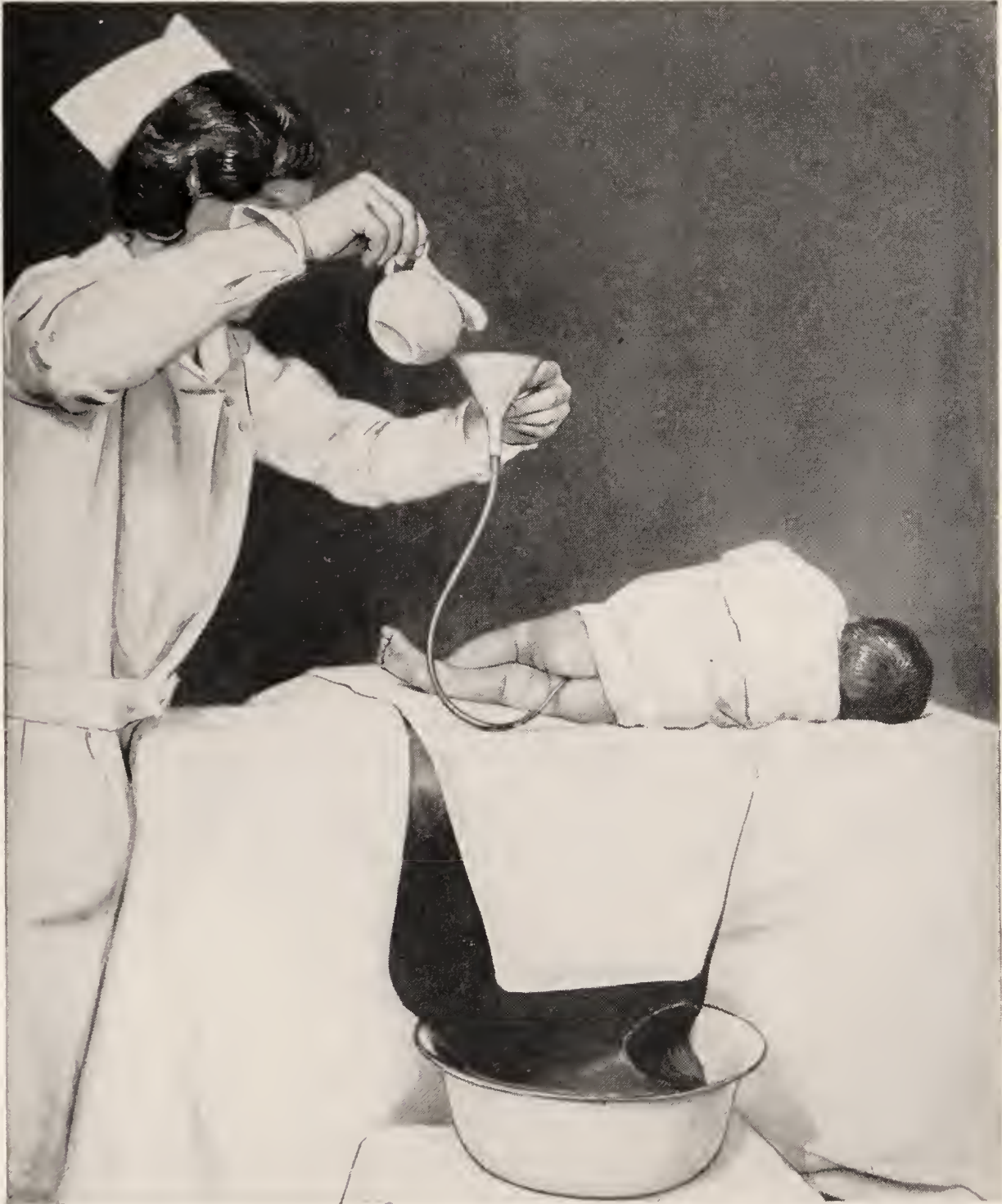


Fig. 97.—Giving a colonic flushing. The infant rests on its side, warmly covered. A towel covers the rubber drainage sheet.

colicky, with audible borborygmus (rumbling in the bowels), a colonic flushing of normal salt solution (0.6 per cent) may be given. This is done with a soft-rubber catheter (size

No. 10 or 12 American scale), to which is attached a little funnel or the barrel of a glass syringe. The salt solution is allowed to run in and out, 2 or 3 ounces at a time, for five or ten minutes, until the bowel is well evacuated and cleansed. The room should be warm and the infant exposed as little as possible. The tube and funnel are boiled and sterile water used to make the salt solution.

The child is laid on its side across the nurse's knee or on a convenient table. A rubber drainage sheet is arranged under the buttocks of the infant, and thus the discharges are conducted into a jar on the floor. A catheter cannot be passed very far into the sigmoid flexure, and an attempt to do so is dangerous. If the tube is inserted beyond the sphincter, it is enough. Anything unusual (blood, mucus) is to be saved for the physician's inspection.

If the bowel movements are acrid and irritating, the anal region may become deeply eroded. This can almost always be prevented, but if the condition of the bowels cannot be improved, and especially if the baby is fed by the bottle, the disease is obstinate and hard to cure. There is danger in allowing the buttocks to become sore—danger of infection, especially erysipelas, which is usually fatal.

When the diaper is changed the buttocks and thighs are sponged off with a soft cloth and cool water, using little and gentle friction. If the skin is healthy, no powder is needed, but if there are redness and beginning irritation, stearate of zinc powder is applied, although not enough to form flakes. Don't fluff it near the baby's face.

If an erosion forms or threatens, no water at all may be used, but the buttocks are cleansed with the finest olive oil procurable (not vaselin), and the excess is removed with gentle pressure with an old linen towel or lintine. The cloth is used as one would use an ink-blotter. The stearate of zinc is also sometimes useful here, but if it fails, pure oxide of zinc ointment may be applied. The physician's advice should be asked regarding all erosions, as they may indicate

a syphilitic taint. These instructions are not to take the place of the physician's prescription, but are given to those nurses who have to do much on their own responsibility.

Attention to the intestinal tract is of prime importance in preventing and curing this "chafe," or eczema intertrigo.

The Diaper.—It is important to have a large, thick, soft diaper, flatly folded and smoothly applied. Gauze diapers are useful for the first week. The use of rubber sheeting to prevent soiling the dress is bad; for this purpose an extra diaper should be wrapped around the trunk of the infant.

The diapers should be scrupulously clean, and soap alkali and washing-powder thoroughly rinsed out of them. If strong soaps are not thoroughly taken out of the fabric in the laundry, they irritate the delicate skin of the babe and may cause eczema. The same may be said of all the infant's clothes. A diaper wet with urine must be washed in water and dried before being used again. It is best to use laundered and sterilized diapers. Even though the infant's urine is clear, when dried it gives off an odor and is irritating (probably ammoniacal decomposition). In boys the diaper must be applied a little differently than in girls, care being taken that the parts are not pressed into an uncomfortable position.

Urination.—The infant should urinate freely, and, since it does so, is often wet. Unless the diaper is frequently changed the skin will macerate and the nates becomes sore or chafed.

If the child passes the reddish brick-dust sediment described before and known as uric acid, this should be noted; it calls attention to the fact that the child needs more water.

If the child does not urinate within a few hours after birth, the nurse should carefully inspect the parts to determine the existence of any abnormality of structure. If she suspects such, the physician should be notified.

In order to get the infant to urinate it should be given water freely; then it should be held sitting in a bowl of

warm water for five minutes; a warm fomentation over the kidneys, a prolonged saline solution colonic flushing—all these may be used to stimulate the flow of urine. The condition may go thirty-six hours without danger. In one case the infant passed no urine for three days and did not suffer. Catheterization is necessary only in the rarest cases. It must be remembered that the child may urinate, unobserved, in its bath, or the urine, being colorless, leaves no stain on the diaper and evaporates before the nurse notices the latter. If the condition is obstinate, the physician will usually order a diuretic, of which the sweet spirit of niter is a favorite.

Nursing.—The child should be put to the breast after the mother has rested, which is usually about eight hours after birth, then every eight hours until the milk comes in, then every four hours during the day, but not during the night. Babies weighing less than 2700 grams are on three-hour schedule. Sluggish babies and those weakened by hard delivery, or sickness, or whose mother's milk comes with difficulty are also on three-hour nursings. The best hours to choose depend on circumstances. In the home, 7 and 10 A. M., 1, 4, 7, and 10 P. M., and once about 2 or 3 A. M., are usually the best. In the hospital the hours given on p. 203 are more convenient. Before and after each nursing, if necessary, the diaper is changed. Occasionally if the tongue is coated it may be cleaned with cotton pledgets wrapped around the finger and saturated with boric solution. The nurse should have clean fingers and be careful not to scratch the delicate mucous membrane, as it may easily be infected. Should the whitish pellicle on the tongue not come off readily, a grain of baking-powder on the surface will accomplish it. The mouth requires no routine treatment. To try to disinfect the child's mouth to prevent breast infection is futile. In fact, the writer believes such attempts favor infection by making sores in the mouth at the angle of the jaws. Before nursing the nip-

ple is washed with saline solution on an applicator, and afterward likewise, and if there is any soreness at all the nipple is anointed with albolene or cocoa-butter. Neither before nor after nursing is the infant's mouth to be washed. Each nursing should last not over fifteen minutes, and the infant must be watched to see that it gets enough. Often it gets all it needs in the first four minutes. The babe must suck and swallow too. If the breast is dry the child will suck, but will have nothing to swallow. A good supply is shown by the milk running out of the infant's mouth and by weighing before and after nursing. It must not be allowed



Fig. 98.—Glass nipple-shield.

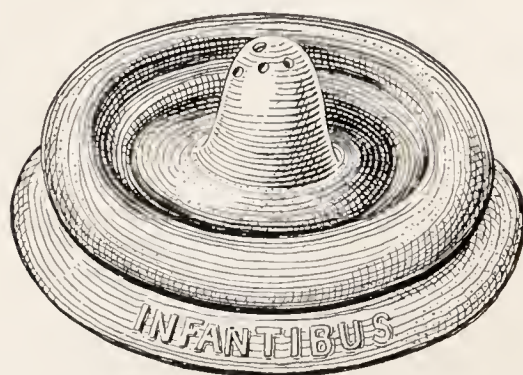


Fig. 98a.—“Infantibus.” Nipple-shield for nursing. Adheres to breast on vacuum principle. Helps flat nipples. (From Griffith, “Care of the Baby.”)

to sleep at the breast, because this macerates the nipple and favors the formation of cracks, which may easily lead to infection and mastitis.

Nursing, preferably, is from alternate breasts, although sometimes, for stimulation, both breasts are used at each feeding.

By adhering to these rules the child soon learns correct habits, which make the whole period of infancy healthier and less troublesome.

In the long intervals between nursing the child may need a little warm water, but not more than 3 ounces a day, and

it should not get into the habit of water-tippling—lying with the bottle in its mouth all night. Some children do not take to the nipple well, but fret and fuss over the nursing. This is sometimes due to too full breasts, a small or flat nipple, or because the milk does not agree with the child, or because there is none there. Sometimes the milk is salty or bitter, which may be true of only one breast, or the milk may flow readily from one breast and not from the other. The child will prefer the easier side always.

Various expedients may be tried to get the child to nurse: First squeeze a little milk into the child's mouth. Second, put a nipple-shield (Fig. 98) full of sterile water over the nipple; the child will empty this, and will learn to suck the milk following. Third, put a hot wet compress over the nipple for a few minutes before nursing to bring the "milk to the surface"—really to facilitate the making of milk. Fourth, start the flow with a breast-pump and then put the infant to the breast. Fifth, pump the milk and feed the child from a bottle until it is stronger and feels the sensation of hunger. It is possible to obtain milk from the breasts by milking them, but one must be careful not to bruise or infect the breasts and cause mastitis (Fig. 99).

Expressing the Milk from the Mother's Right Breast.—The nurse arranges the mother on the bed in the position of nursing a baby. Have ready: Three sterile towels; one small sterile basin to receive milk; one breast tray.

Place a chair by the side of the bed. Scrub hands thoroughly and dry on a sterile towel. Arrange sterile towels, one under the breast and one over the chest. Wash area around nipple with boric solution. The nurse then sits in the chair by the bed, taking the sterile milk receptacle in the left hand, holding it slightly tilted under the nipple against the breast.

With the right hand placed firmly on the breast, four

fingers above and thumb beneath, about $\frac{1}{2}$ inch from the areola, make slight pressure on the lacteal ducts, not the gland itself, backward, then forward, gradually pressing the thumb and fingers together, at the same time drawing



Fig. 99.—Milking the breasts. Gentle sliding pressure with the thumb and fingers along the courses of the lacteal ducts.

them about half-way over the areola to the nipple. This motion is repeated in fairly rapid succession, varying the position of the fingers a little until the breast is empty.

The milk will not come readily at first, and at the start-

ing of the flow may be slightly painful to the mother; therefore great gentleness and patience are required on the part of the nurse. (Description by Mrs. Ella C. Cole, R. N.)

The nurse must be convinced that the child gets sufficient nourishment. If there is no milk in the breast the child swallows air, and then suffers both colic and hunger. Some infants, especially little ones, fall asleep after nursing, and are "good children," but lose weight steadily and die of marasmus. If there is any doubt about the child getting enough milk at each nursing, it should be accurately weighed before and after being put to the breast. These weights are recorded, and the difference represents the amount swallowed. It is not necessary to undress the babe for these weighings. Adding these amounts for twenty-four hours gives the daily amount of nourishment. The table below shows the daily amounts taken by an infant for the first three weeks.

The Diet.—For the first few days there is nothing but colostrum in the breasts and the baby gets this. It needs water besides, which should be given every two hours, 1 ounce at a time. Most children are satisfied with these for the first two days, but sometimes it is necessary to administer food and water, and unless these are given the child will fret, cry, even develop fever—the so-called "starvation or thirst fever." One must be very careful not to call all fevers of the newborn starvation fevers, because most of them are due to sepsis—intestinal, bronchial, or from the navel or throat.

A fever later, especially when the child is on artificial food, is often due to intestinal fermentation, and subsides after castor oil and a colonic flushing have been administered. In a maternity hospital the child can obtain nourishment for the first few days from one of the nursing women in the wards, but in private practice, if the mother has no milk, artificial food must, if needed, be substituted. A

dram of cream to an ounce of water, or weak milk of "Dryco powder" may be given to tide the infant over until the secretion in the mother's breasts is established.

N. B.—*Before putting a child to any breast but that of its mother the nurse must know that neither is syphilitic nor otherwise diseased.*

After the milk comes these foods should be discontinued. Should the mother permanently have no milk, or not enough, or milk of poor quality, artificial feeding must be resorted to, which is really a great calamity, or a wet-nurse must be procured, which is the lesser of the two evils. It is hard, sometimes impossible, to find a good wet-nurse, in

TABLE¹

	Number of nursings.	Average amount drunk at each nursing.	Total grams.	Total ounces.
1st day.....	2	2.5 grams	5.0 grams	1 $\frac{1}{4}$ drams
2d ".....	5	29.0 "	145.0 "	4 $\frac{3}{4}$ ounces
3d ".....	6	41.0 "	246.0 "	8 $\frac{1}{4}$ "
4th ".....	7	58.8 "	411.6 "	13 $\frac{2}{3}$ "
5th ".....	6	67.5 "	405.0 "	13 $\frac{1}{2}$ "
6th ".....	7	73.0 "	511.0 "	17 "
7th ".....	6	92.2 "	553.2 "	18 $\frac{1}{2}$ "
8th ".....	7	97.0 "	679.0 "	22 $\frac{2}{3}$ "
9th ".....	6	93.0 "	558.0 "	18 $\frac{3}{5}$ "
10th ".....	7	86.0 "	692.0 "	23 "
11th ".....	6	96.0 "	576.0 "	19 $\frac{1}{5}$ "
12th ".....	6	93.0 "	558.0 "	18 $\frac{3}{5}$ "
13th ".....	7	86.0 "	602.0 "	20 "
14th ".....	7	91.0 "	637.0 "	21 $\frac{1}{4}$ "
15th ".....	6	93.0 "	558.0 "	18 "
16th ".....	7	90.0 "	630.0 "	21 "
17th ".....	7	92.0 "	644.0 "	21 $\frac{1}{2}$ "
18th ".....	6	96.0 "	576.0 "	19 $\frac{1}{6}$ "
19th ".....	7	105.0 "	735.0 "	24 $\frac{1}{2}$ "
20th ".....	6	112.0 "	672.0 "	22 $\frac{1}{3}$ "
21st ".....	7	102.0 "	714.0 "	23 $\frac{5}{6}$ "

¹ This table is from Ahlfeld, and was from his own child.

which case the child must be given artificial food—a difficult and often unsatisfactory task. The nurse should urge the mother to nurse her infant, and only give up in the presence of real danger to herself or because the milk does not agree with the baby. Remarkable as it may seem, the milk of some mothers acts like an irritant intestinal poison to the infant and may produce enteritis or even death.

If there is a scarcity of mother's milk, one may try to stimulate the glands, first, by daily massage, cold bathing of the whole body, Bier's suction treatment, giving much fluid to drink—especially milk, water, cocoa, gruels, and oyster-stews, but no tea, coffee, beer, or malt liquors. The two last fatten the patient and reduce the milk-supply. A strong baby is the best stimulant to the breasts, and if this fails to bring milk, usually there is no gland tissue there, and all efforts will be futile. Occasionally the milk-supply is not abundant until the patient is up and about and takes out-door exercise. Then, too, the milk may be deficient in health-giving qualities because the mother's own food lacks them. (See *Diet of Puerperae*, p. 207.)

If the baby must be reared on the bottle, the first difficulty is to select the proper food, and infants show remarkable peculiarities in this way. Some will thrive on a preparation that seems to poison the next. Medical opinion also sways from one kind of feeding to another. (See chapter on Infant Feeding.)

If the mother can give the baby only one nursing a day, she should do so, because there is something in mothers' milk that the finest chemistry cannot find or imitate—a life-giving something—and it helps the baby to digest and assimilate the supplied food.

Weighing the Infant.—The child should be weighed directly after birth; it should be naked, but protected from the cold. Thereafter, every day before its bath, its weight should be taken and recorded.

The scale used should be an "even balance" grocer's scale, with a scoop on one side and iron weights on the other (see Fig. 52). A sliding weight on a scale-bar in front gives the ounces. The scoop should be wired fast to its supports, so that the infant cannot shake it off. A napkin is placed in the scoop, and one of exactly the same size is folded up on the weight plate. These balance, and the actual weight of the infant is thus easily obtained. In maternities a sterile napkin or, for economy, a sterile newspaper must be used for each infant, to avoid carrying infection. The baby is thus spared the shock from the cold metal and the scoop is kept clean.

The amount taken from the breast varies with the age of the infant—1 or 2 drams the first few days to 2 or 3 ounces by the tenth day; it varies in different infants, some taking less than others, this being governed somewhat by the child's size, and it varies at different nursings, a large nursing usually being followed by a lighter one, which means that the appetite of the child varies.

The Temperature, Pulse, and Respiration.—These should be taken A. M. and P. M.—certainly the temperature, and, when possible, the others also. A rise to 100 F. is the signal for the 4 hour schedule. The infant should have a record sheet of its own, and all notable occurrences recorded. It is very difficult to count the respirations, and even normally they are irregular. With a little practice the pulse can be readily counted, the best place being just in front of the ear and when the child sleeps. The radial pulse is also sometimes countable.

Fresh Air.—Babies should have much more fresh air than they are usually given. They need it more than grownups because their metabolism is more active. If the crib is shielded by a good screen a very active circulation of air through the room will be distinctly beneficial to the child, stimulating the appetite and digestion and bringing restful sleep. In mild weather even new babies may be out on the porch.

The room should be kept at a temperature of about 60 to 70 F. It must be light enough to enable the nurse readily to observe the condition of the child, but the infant must not lie in too bright a glare. The child's feet are often cold, so a hot-water bag must be used, sometimes even in summer. The bag should be warm, not hot, so as not to burn the infant. The child must not lie with dresses moist from urination or vomiting, from a leaky hot-water bag, or from a bottle given it to drink.



Fig. 100.—Carrying child. (Blanket omitted for illustration.) Note how elbow of nurse protects head from accident. Arm supports the back.

All these precautions are especially necessary with premature or weak infants.

In the heat of summer the child may lie in its crib, protected from drafts, but with nearly all its clothes off. At the Chicago Lying-in Hospital, on the hot days, the babies have only the belly-band and diaper. There has been a striking reduction of the number of cases of fever, of intertrigo, and other skin eruptions. The children sleep better and in all ways are improved by this rational dress.

In carrying the child through corridors it should be held as in Fig. 100 (but wrapped in a blanket), with the head nestling snugly in the bend of the elbow.

Training the Baby.—The infant must not be disturbed except for needed attention and for nursing. It must not be on show to all the relatives and friends. It must be handled carefully, and when being lifted up the head must always be supported and not allowed to fall to the back or side. When bathing the child the large abdomen or breasts must not be pressed too hard. After nursing the child must not be jarred, because it may regurgitate the milk. The nurse must not allow the infant to get into bad habits—for example, water-tipling, peppermint-tipling, sucking on a nipple or the finger, water- and whisky-tipling, sleeping with its mother or other person, being taken up when it cries, held, rocked, or carried, etc.

The nurse should strive consistently for regularity and punctuality of feeding, bathing, changing, sleeping, airing, etc., but these must not be made a fetish and overdone. The baby, even a few weeks old, has a personality. Some are inveterate non-conformists. Usually, however, by proper training the child may be taught to sleep nearly the whole night through, to sleep between nursings, and to cry only when hungry, uncomfortable, or sick.

Home from the Hospital.—When the nurse goes she leaves a painful void in the house, and it is important, therefore, that she has instructed the young mother in many things pertaining to herself and the baby. Indeed, the rôle of the nurse as a public health teacher cannot be emphasized often enough. The topics of dress, diet, bowels, bathing, aseptic care of the vulva, and particularly the minute asepsis of the nipples, should all be thoroughly discussed. The patient is advised regarding the first menstruation, that it may be profuse, and what to do (rest and call the doctor who may prescribe ergot, hydrastis, and a hot douche). The nurse will also investigate the

home conditions with a view of giving helpful counsel regarding the amount of exercise, of work, of social activity, which the patient may be permitted to do.

The baby's care, however, will be of most interest to the mother, and the nurse should teach her, first of all, the necessity and the principles of absolute cleanliness in all her ministrations to the infant. If the navel is not healed, she is taught to dress it. Instructions in the preparation of food, of drink, the bathing of the child, the care and sterilization of its clothing, etc., are all carefully imparted to the willing mother. The nurse may be asked about books on the care or rearing of infants. Dr. Kerley's *Short Talks with Young Mothers*; *Infancy and Childhood*, Ramsey; *Baby's Food*, by Dr. I. A. Abt., may be recommended.

A supply of pads, breast applicators, boric solution, and other necessities, is left with the patient. Finally, she is instructed to visit her physician, four to eight weeks after delivery, according to his practice, for examination to determine the state of involution of the genitals, etc. A retroverted uterus or other abnormality might be discovered and cured by simple methods. If neglected at this time permanent invalidism might ensue.

When the nurse gives up her charges—the mother well, content and happy, with a healthy, lusty infant in her arms—she is entitled to a feeling of deep satisfaction as of something she has helped to bring about. To have been the one to confer the blessings of modern science on two human beings is no small privilege. Her duties as an obstetric nurse are now ended and she may with confidence turn her charges over to the infant's nurse. The author would refer the readers to books on infant nursing, which usually also treat of the care of the nursing mother.

CHAPTER IV

PRESENTATIONS AND POSITIONS

HERETOFORE labor has been spoken of as if it occurred with the child always presenting by the head. Such is by no means the case. During pregnancy the child moves about a great deal, but in the latter weeks is usually found with its head downward. This is because the head is slightly heavier than the body and because the ovoidal contour of the child best conforms to the uterine ovoid. When labor begins we may find any part of the child's person lying over the birth canal. The head presents in 96 per cent of all cases, the breech in 2.7 per cent, the shoulder in 0.7 per cent, and the face in 0.6 per cent.

The term "presentation" has reference to that part of the fetus which presents itself at the internal os first for delivery. After learning what part is coming first the physician must study the mechanism by which nature intends to advance the child through the parturient passage. Consequently he must know what position the child holds in relation to the mother's pelvis.

The pelvis, therefore, is divided into four quadrants as follows: Left anterior, left posterior, right anterior, and right posterior (Fig. 101). These terms are applied when the patient stands facing the observer.

The technical term "position" has reference to the relation the presenting part bears to these four quadrants of the mother's pelvis—for example, if the occiput occupies the left anterior portion of the mother's pelvis, we speak of an occipito left anterior position—O. L. A.

We choose arbitrarily a prominent point in the presenting part from which to determine the relation of the presenting

part to the four quadrants of the pelvis. This point is called the "point of direction." In vertex presentations the point of direction is the occiput; in breech presentations, the sacrum; in face presentations, the chin; in shoulder presentations, the scapula.

When a doctor seeks to determine the presentation and position, he must find out what part of the fetus is presenting and then what relation the point of direction bears to the pelvis, which gives him the position.

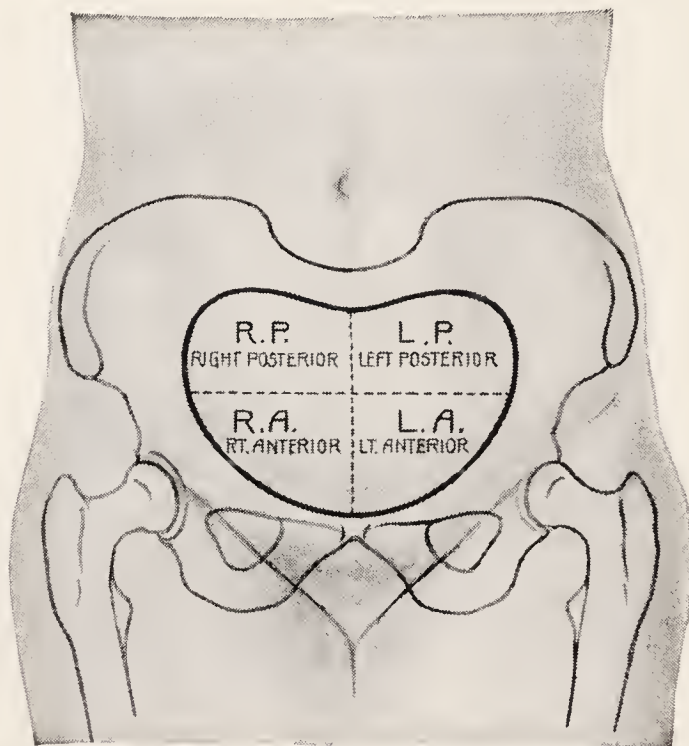
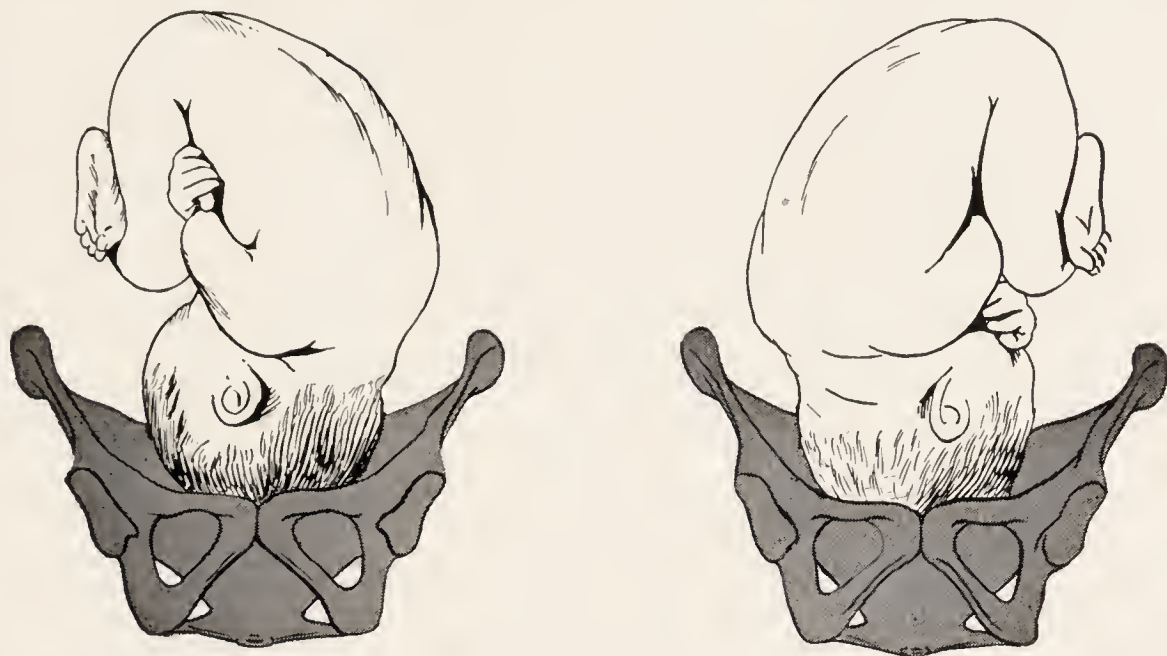


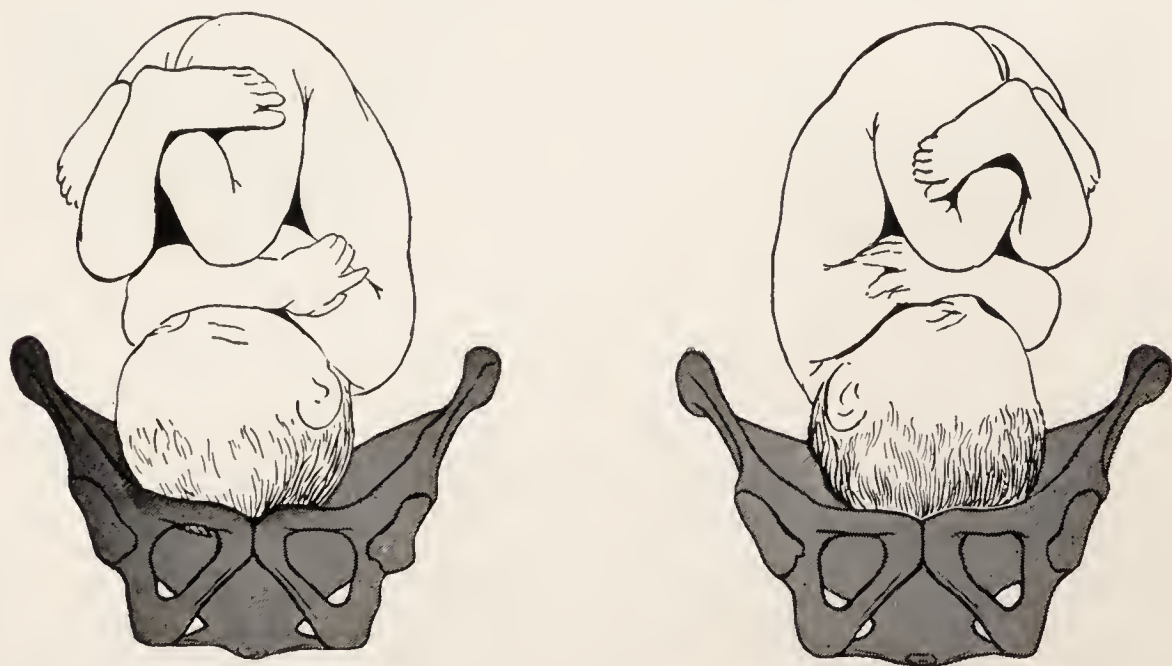
Fig. 101.—Diagram of the four quadrants of the pelvis. The reader faces patient.

The most common presentations are vertex (often called occipital), breech, face, shoulder, and brow. In breech cases the feet may be doubled under the child, as a tailor sits on a bench; the feet, one or both, may fall down and be visible at the vulva (single or double footling); the knee may come down, or, curiously, the legs may be extended upward along the chest so that the toes are against the face. These last are difficult cases, although most often breech deliveries are spontaneous.

In each of these presentations we have four or more positions: for the occiput, left occipito-anterior, O. L. A.; right occipito-anterior, O. E. A.; right occipito-posterior,



Occipito left anterior. O. L. A. Occipito right anterior. O. D. A.
(The abbreviations are from the Latin terms.)



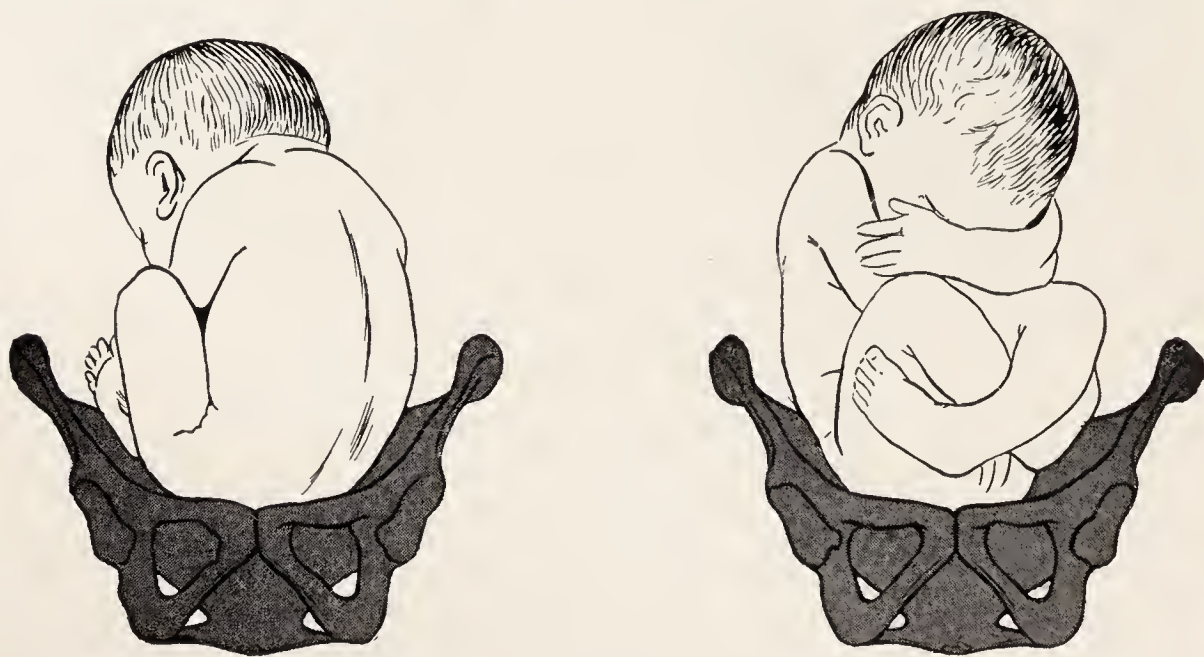
Occipito left posterior. O. L. P. Occipito right posterior. O. D. P.

Fig. 102.—The four positions of occipital presentation.

O. D. P.; and left occipito-posterior, O. L. P. (Fig. 102). The abbreviations are those of the Latin terms used for these positions. *Laeva* = left, *L.*; *Dextra* = right, *D.*

Sometimes the abbreviations of the English terms are used—L. O. A. = left occipito-anterior. R. O. P. = right occipito-posterior. L. O. T. = left occipito-transverse. R. O. A. = right occipito-anterior.

For the breech, the sacrum is the point of direction, and we have the sacro left anterior, sacro right posterior, etc. (Fig. 103). For the face, the chin is the point of direction, and we speak of mento left anterior, mento right posterior, etc. (Fig. 104). In shoulder presentations we have scapula left anterior, scapula right posterior, etc. (Fig. 105).



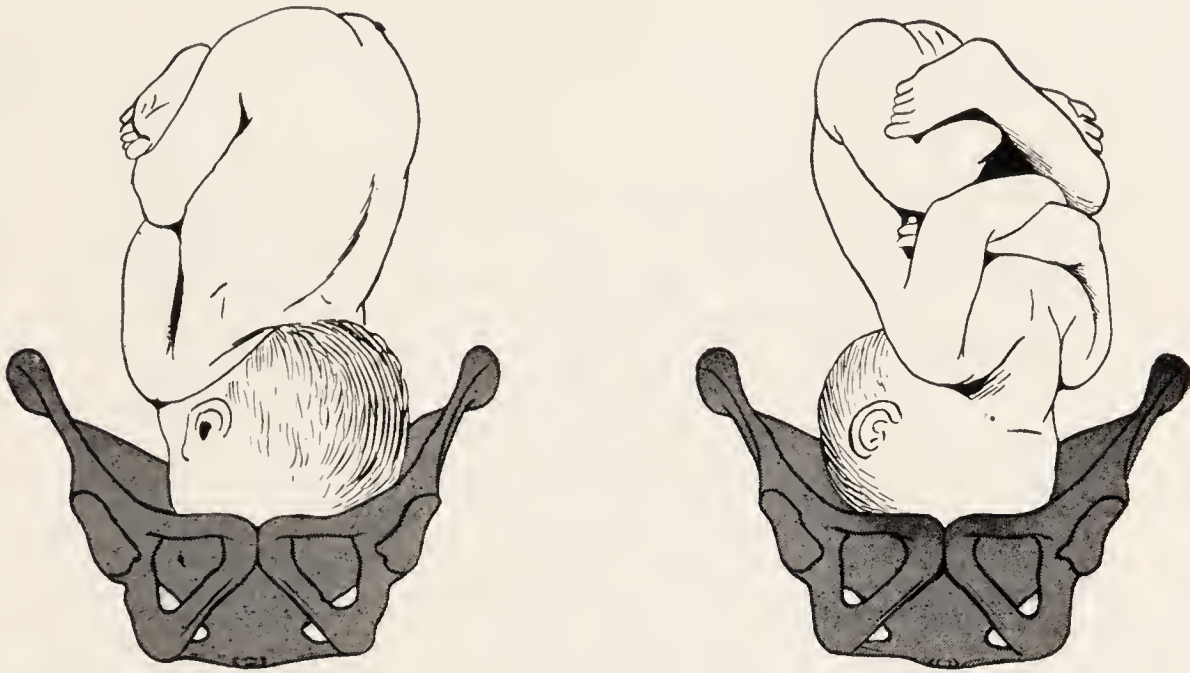
Sacro left anterior. S. L. A.

Sacro right posterior. S. D. P.

Fig. 103.—Two of the positions of breech presentation.

The term *attitude* means the relation of the members of the child to its trunk. The normal attitude is shown in Figs. 102, 103. When the arm or cord presents alongside the head, this is a faulty attitude. *Engagement* of the presenting part means that that portion of the baby has fully entered the pelvis. On p. 69 we spoke of lightening or dropping of the child. This means that the head has descended, engaged in the pelvis, and in primigravidae (women pregnant for the first time) it usually occurs in the last two weeks of pregnancy. If the pelvis is contracted

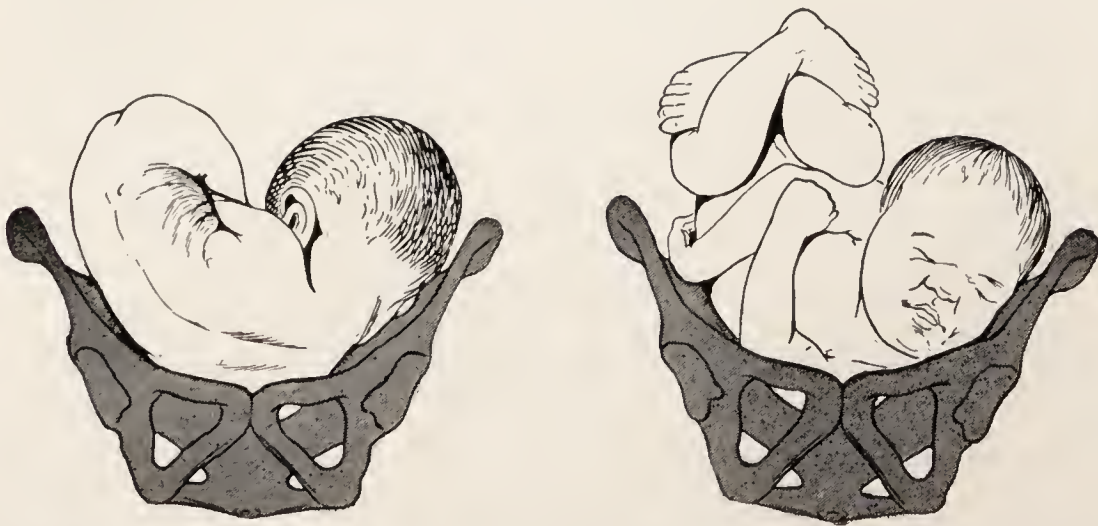
or the inlet blocked by a tumor the head cannot engage or does so with difficulty. In breech cases and in multiparae



Mento right posterior. M. D. P. Mento left anterior. M. L. A.

Fig. 104.—Two of the positions of face presentation.

(women who have borne several children) the presenting part usually remains high until labor is well advanced.



Scapula left anterior. Sc. L. A. Scapula left posterior. Sc. L. P.

Fig. 105.—Two of the positions of shoulder presentation.

Engagement is sometimes called “station,” and four degrees are described: (1) the presenting part is high or “floating”;

(2) it is “fixed in the inlet”; (3) it is “fully engaged”; (4) it is “at the outlet.”

The Diagnosis of Presentation and Position.—It is often desirable that the nurse be able to tell whether or not the presentation is normal. Particularly is this true in



Fig. 106.—Is the ovoid longitudinal or transverse?

country practice. With a little experience the nurse will learn how to determine the position of the child in the uterus in most cases. She must first wash and warm her hands, then lay them flat on the abdomen and palpate gently without jabbing motions which would startle the

muscles into action and pain the woman, especially if she should press on an ovary. There are four principles in this diagnosis which may be put in the form of questions:

1. *Is the uterine ovoid longitudinal or transverse?* (Fig. 106). If longitudinal, the child lies in either head or breech

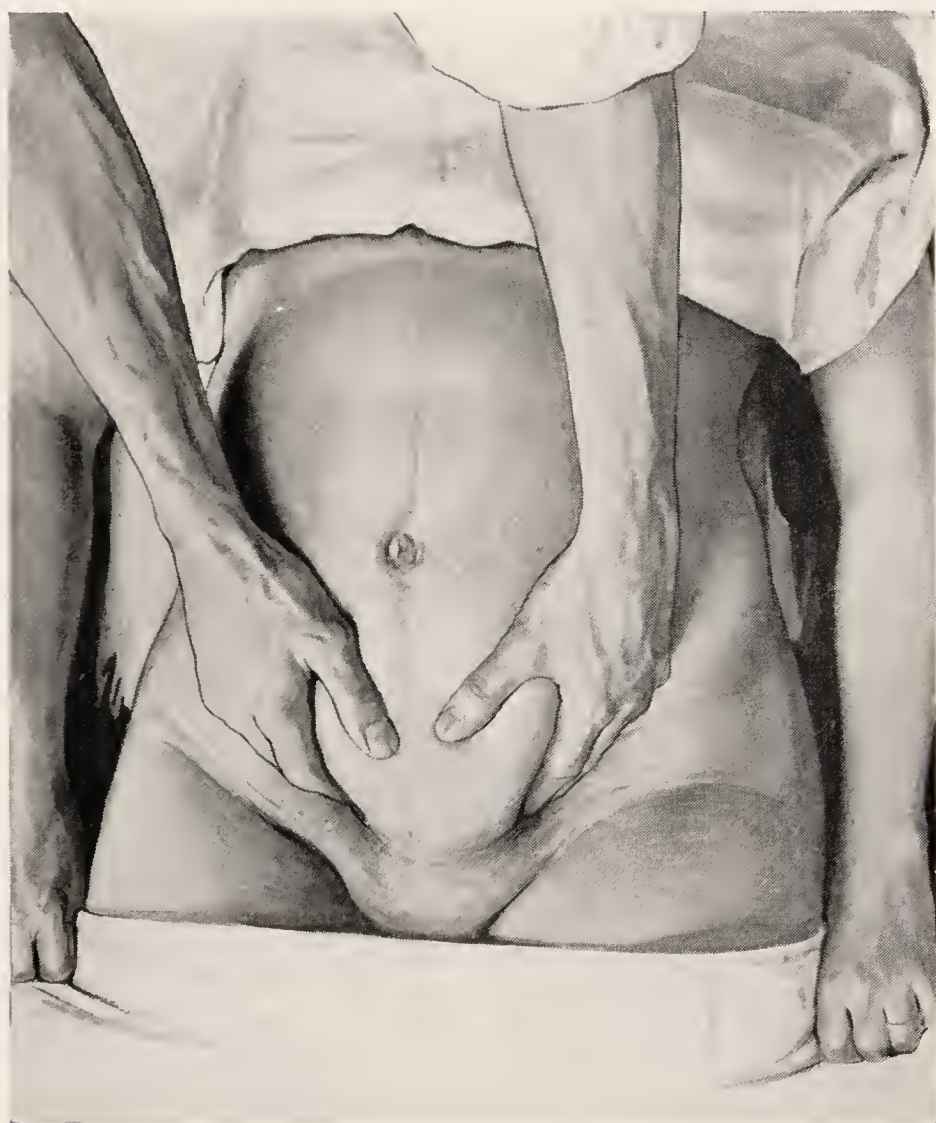


Fig. 107.—What is over the inlet?

presentation. The nurse lays her hands along the flanks of the patient, and brings the large uterus between them. If the greatest diameter lies parallel with the mother, the uterine ovoid is longitudinal.

2. *What is over the inlet?* (Fig. 107). The nurse places the hands over the lower abdomen and presses inward with the finger-tips until she feels the lower pole of the child.

If this is hard and round, it is the head; if soft and irregular, the breech.

3. *What is in the fundus?* (Fig. 108). The hands are placed in a corresponding position on the top of the uterus, and the same points noted.

4. *Where is the back?* One hand is placed on each side of the uterus and, pressing inward with them alternately,

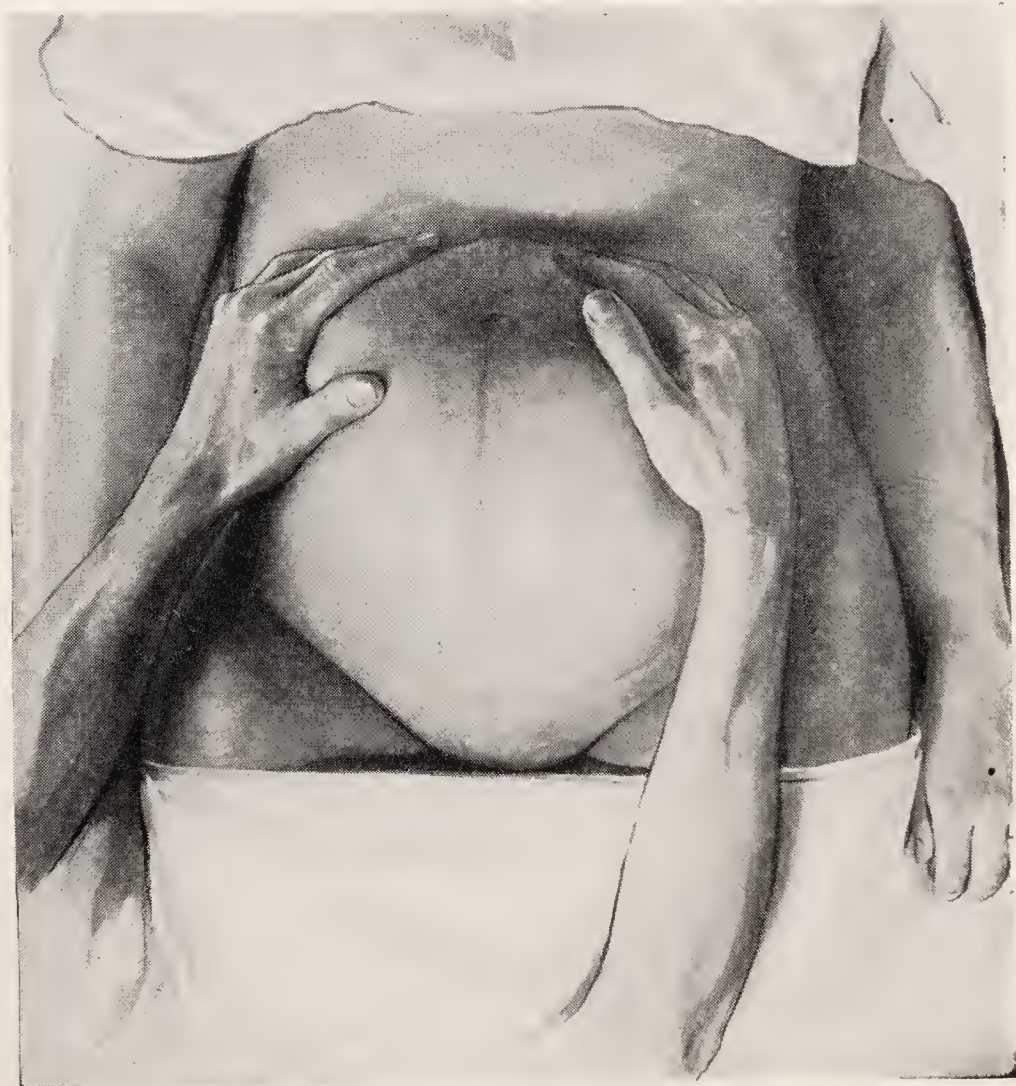


Fig. 108.—What is in the fundus?

the nurse determines which side is more resistant. The more resistant side represents the back.

With these points of information one can usually construct the diagnosis. For example, if the ovoid is longitudinal, the head over the inlet, the breech in the fundus, and the back on the left side, the case is one of occipito left

anterior or posterior. There are many finer points in this method of diagnosis which the physician practices, but which cannot be gone into here.



Fig. 109.—The determination of the engagement of the head by rectal examination. The nurse first touches the lowest part of the head, then feels for the spine of the ischium on the side of the pelvis. Has the head in the illustration passed below the spine? In this case no, therefore this head is not engaged.

Of all the presentations, the occipital is the most favorable for mother and child, and of the four positions of the occiput, O. L. A. is the best. Fortunately, this is the one most commonly met in practice.

The Engagement of the Presenting Part.—The head may be high above the inlet or “floating”; it may be “fixed in the inlet.” It may have passed the plane of the inlet with its largest diameter; we then say it is “engaged”; it may be “in the midplane”; it may be deep in the pelvis “on the perineum.” It is of utmost importance for the physician to know at all times during a labor the “degree of engagement” or “location” or “station” of the head, and the rate of its advancement down the birth canal. The nurse may learn how to determine these points by studying Fig. 109. With the finger, per rectum, the nurse first touches the lowest portion of the baby’s head, then searches for the prominent spine of the ischium on the side of the pelvis. The distance the head lies above or below this spine will determine the degree of engagement, and the nurse will try to estimate it in centimeters or inches, charting her findings thus: Head 1–2–3 cm. above or below spine, as the case may be. The operation looks difficult, but with a little practice the nurse will learn to do it quite accurately.

The nurse is aware that the head, in order to pass through the pelvic canal, must rotate horizontally on the neck, so as to bring its long axis to correspond with the anteroposterior diameter of the outlet. If the occiput is in the left anterior quadrant of the pelvis, it has only to rotate a small part of a circle to get in front; but if the occiput be in the right or left posterior quadrant of the pelvis, it has to rotate nearly half a circle to get in front under the pubis. This rotation takes a long time, is painful and tedious, so that sometimes the patient’s strength gives out before it is accomplished. Then the doctor must aid her with the resources of art. These are called “posterior positions,” and the accoucheur usually prefers not to meet them. On p. 68 is a description of labor in occipital presentation.

Breech Cases.—The mechanism of breech deliveries is this: under strong pains the breech comes through the

vulva and rises up toward the pubis, the accoucheur simply receiving the child as it appears. The legs now drop out as the child emerges; the patient bears down strongly, and the shoulders are delivered, after which, unless there is some abnormal delay, the head comes with the face over the perineum.

Should there be any delay in the delivery of the shoulders, the patient is exhorted to bear down, and an assistant,



Fig. 110.—Wiegand-Martin method of delivering the after-coming head by flexion through seizure of lower jaw, and extrusion by means of pressure in axis of brim by a hand acting from above.

the nurse or the husband, makes steady pressure over the top of the uterus, thus forcing the child down. If this is not successful, the doctor delivers the arms gently, then inserts the fingers into the infant's mouth, and, with the other hand over the fundus of the uterus, carefully and slowly brings the face over the perineum, after which the occiput comes from behind the pubis (Fig. 110).

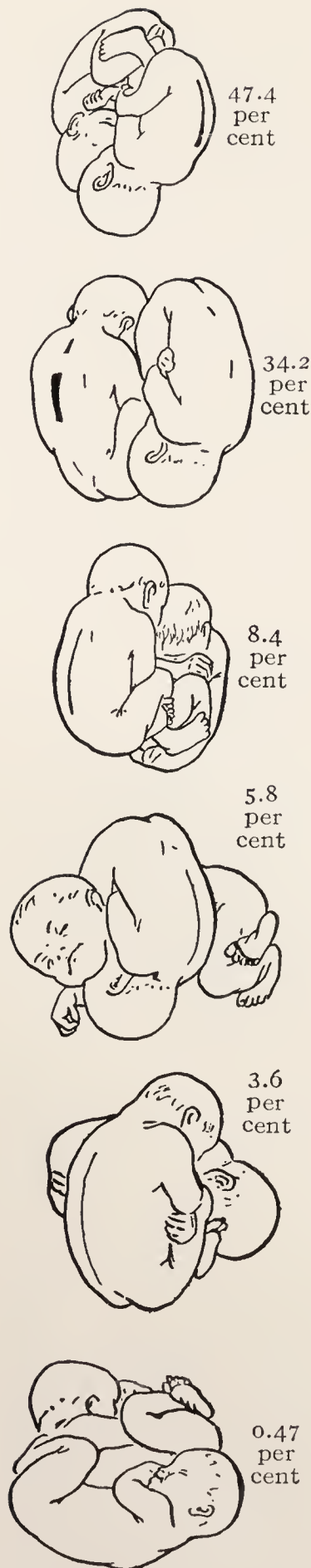


Fig. 111.—Percentage table of twins.

Shoulder or Transverse Presentation.—When the child presents other than longitudinally we speak of transverse presentation. The laity call it a “cross birth,” and it is a serious accident, for, unless the infant can be turned so that its long axis corresponds with the long axis of the mother, either one or both of the lives will be lost. The uterus cannot expel the child in this position unless it is very small or macerated, and bursts in the attempt, or both mother and baby die of exhaustion undelivered. As soon as such an unusual condition is discovered the accoucheur will turn the child into a more favorable presentation. This operation is called version.

MULTIPLE PREGNANCY

Once in 87 cases twins are born; once in 7100, triplets; once in 757,000 quadruplets, and five children at a birth once in 41,600,000. One case of sextuplets is on record. The causation of multiple pregnancy is unknown. Heredity plays a strong rôle and plural births occur in especially fertile races and women.

As a remarkable instance of fertility may be mentioned the Civil War nurse and physician, Mary Austin, who had 13 twins, 6 triplets, in all 44 children, her sisters having 41 and 26 respectively.

Twins are of great scientific interest. They may come from one ovum (every nurse has seen an egg with 2 yolks) or from two separate ova. In the first instance the twins are called monochorionic and there is only one placenta, but usually two amniotic sacs, and the babies are always of the same sex. They usually show great similarity in appearance and development, also of physical and mental and temperamental qualities. If two separate ova are fertilized, dichorionic twins, there are two complete ovi-sacs—the placenta may or may not be fused; the sex of the babies need not be the same, and their characteristics may vary as much as any two children of the same mother.

Twins cause the mother considerable distress during pregnancy because of the abdominal distention, the swelling of the feet, the symptoms of toxemia, etc., all of which are greater than with a single child. Eclampsia is very common. Premature labor is usual (70 per cent of the cases). Parturition itself is abnormal because the stretched uterus cannot contract well, therefore we meet delayed labor, complicated presentations, even interlocking of the children, and postpartum hemorrhage.

The diagnosis of twins is certain only when two distinct and different sets of heart tones are heard, but it may be aided by feeling two heads or two bodies and by the *x*-ray.

After delivery the nurse will need to exercise extra care to build up the puerpera's depleted system, to provide for the nourishment of the babies, and to save the woman from the double wear and tear on her strength, nerves, and mind.

CHAPTER V

OBSTETRIC OPERATIONS

THE obstetric case is a surgical case and the obstetric operation is a surgical operation, with, in addition, all the elements of an obstetric case. The surgeon has to meet and avert the dangers of shock, of anesthesia, of hemorrhage, and of infection; he must know anatomy, pathology, and the physiology of the repair of wounds. He must be a mechanic with a delicate touch and a good seamster. All these must the obstetrician do and be—and more too; he must know the changed physiology of the gravid state; he must be familiar with the mechanism of labor in every presentation and position, and be at all times informed of the condition of the child, which presents its own additional problems.

In making decisions he almost always has two lives to consider, and truly formidable problems are presented for solution, and, unlike the surgeon, who has hours and days in which to plan what to do, he must often decide within a few minutes, or even seconds, if the lives of his charges are to be saved. Furthermore, except in a few specially equipped hospitals the accoucheur must work with insufficient and inefficient assistants, and, what he misses most keenly, without the obstetrically trained nurse and the perfected technic of the surgical amphitheater.

The results of this state of affairs are only too plain. The mortality of appendectomy, of hysterectomy, etc., has decreased almost to the vanishing point, while still over 23,000 women die in childbirth every year in the United States. The millions of women who bear lifelong invalidism from confinement also add testimony as to

the imperfection of obstetric technic, and, if further proof were necessary, the injured babies could raise their voices in protest for themselves and their brothers whose lives were lost during delivery.

The fundamental cause of all this lies in a disappreciation of the art of obstetrics which still holds the minds of the people and, truth compels me to say, the minds of many of the nurses. Labor is considered a normal function and its care lightly entrusted to the unfit, when, as a matter of fact, labor and its complications have the highest pathologic dignity and require the care and attention of the most skilful surgeon and the most efficient nurses.

The people must be educated and the nurse has here a signal opportunity. She may be an active propagandist for the reform and improvement of obstetric teaching and practice, and by example and precept she can help to raise the standard of both to the level of surgery, or even above it. This means that the nurse first gains an intelligent insight into the complicity of the function of reproduction and an appreciation of how much can be done to render it safe; then she transmits this knowledge to all within the sphere of her influence, urging them to support the movement for better obstetric teaching, better obstetric practice, better and more maternity hospitals. If she does this it won't be long before the public will accord the specialty of obstetrics the high dignity it deserves and will demand the supreme quality of service for the child-bearing women, and thus attract to the field the best minds and the most skilful hands in the medical and nursing professions.

Preparation for Operation.—In hospitals, for an obstetric operation, the routine technic of the surgery is simply transferred to the maternity, modified only to meet the demands of the child and the complications peculiar to child-birth. In the home, the nurse will also prepare as for a surgical operation, but, because of the greater frequency

and gravity of the possible complications, her ingenuity will be taxed to the utmost to supply satisfactory conditions. Accordingly here will be presented the methods of meeting emergencies in the home in addition to the special preparations current in hospitals. The most common complications of obstetric operations against which the nurse must be prepared are asphyxia of the child, postpartum hemorrhage, and shock, in addition, of course, to the ever-present danger of infection. It is not true that the stringent rules of asepsis in general surgery may be disregarded in obstetrics. Therefore the nurse will need no advice to prepare sterile towels, sheets, pledgets, gauze, basins, brushes, hot and cold sterile water, etc. All these things the obstetric, as well as the general, surgeon must have.

Obstetric operating is more bloody than any other, and there are many factors which make it the most messy. Such are liquor amnii, meconium, vernix caseosa, and sometimes urine of the baby, the bowel movements and urination of the mother, all of which discharges not seldom take place during the delivery. Aside from the necessity of using much linen and many pledgets, there is great danger of infecting the mother from the fecal matter. Deaths have occurred because of it.

Further, obstetric operating requires more exposure of the field than any other, and the patient may take cold. Frequent changes of the position or attitude of the patient may be required, so that sterile sheets are thereby disarranged. The nurse must see, therefore, that the patient is not too much exposed either to cold or to infection. Obstetric operations are not the deliberate technics of the surgeon, but often necessarily rough and rapid, and with the exhibition of much physical strength. The nurse must not lose her presence of mind and imagine the patient will be torn to pieces, though, sadly enough, in unskilled hands, such may be literally true. Properly, a man may use power

of 150 pounds and not injure the patient or the baby. Improperly used, 10 pounds may do damage.

Obstetric operating is full of surprises and acute emergencies, therefore the nurse must keep her mind focused on the doctor's work. If she has the room, tables, supplies, etc., properly prepared and arranged, things will go more smoothly. So she should, as a labor progresses, like a general during the battle, frequently survey the field to assure herself that everything is in readiness.

If, as the labor goes on, the possibility of an operation is considered, the nurse should provide a suitable operating-table. Most physicians, unfortunately, have to be content with putting the patient across the bed. This is to avoid alarming the patient, but while the doctor may spare the woman a little nervousness, he often unwillingly does her and her babe real injury and is unjust to himself. I know that both women and babies have been lost because the physician could not avail himself of the best auxiliaries obtainable for his work. It goes without saying that an operation can be better performed on a proper table than on a low, back-breaking bed.

The accoucheur should have plenty of assistants for obstetric operations. A rational mind cannot understand why an accoucheur should have to work short handed in such difficult and serious operations, when the surgeon, for his simplest maneuvers, has an anesthetizer, at least one other assistant, and one or sometimes two nurses. This lack of assistants throws extra work on the nurse and often overtaxes her strength. If no other nurses or physicians are obtainable, the nurse should call some courageous woman to hold the limbs of the patient while on the table. The husband usually cannot be relied on; he is likely to faint.

The room should be arranged to resemble as closely as possible the operating-room of a lying-in hospital, and every house has the necessary tables, basins, etc., so that

this can almost always be done if the will is there (Fig. 112). The instruments vary with the operation to be performed

Preparation of the Room.—A kitchen or library table makes an excellent operating table; a sewing-table does well for the instruments and basins; a euchre-table gives additional space. Two kitchen chairs with a table board on them make an excellent side table. A blanket is folded into the form of a pad to put under the patient; this is covered with newspapers. A roll of newspapers is shaped like a



Fig. 112.—A room in a private home arranged for operation. In the center is the kitchen table with a Kelly pad made of newspapers, and covered with a sheet. To the right is a euchre-table carrying a pile of sterile towels, a jar of pledgets, a bottle of sutures, and the instrument pan. On the left is a sewing-table with one bowl of 1 per cent lysol, one bowl of 1 : 1000 bichloride, each with pledgets, a pitcher of fresh hot lysol solution, and a saucer containing scissors and tape for the cord soaking in 1 per cent lysol solution.

Kelly pad, covered with a rubber sheet, or, in the absence of this, with more newspapers (Fig. 113), and pinned in shape with large safety-pins. Over all is thrown a clean sheet. Care is taken to protect the floor around the place of operation. A rug is removed; carpet is covered with heavy paper or a rubber sheet. The sewing-table is put on the side of the operator, within easy reach, and yet far enough away not to interfere with his motions. It holds the hand solution, the basin of pledgets lying in an anti-septic solution (to wash the parts with), and a saucer with a

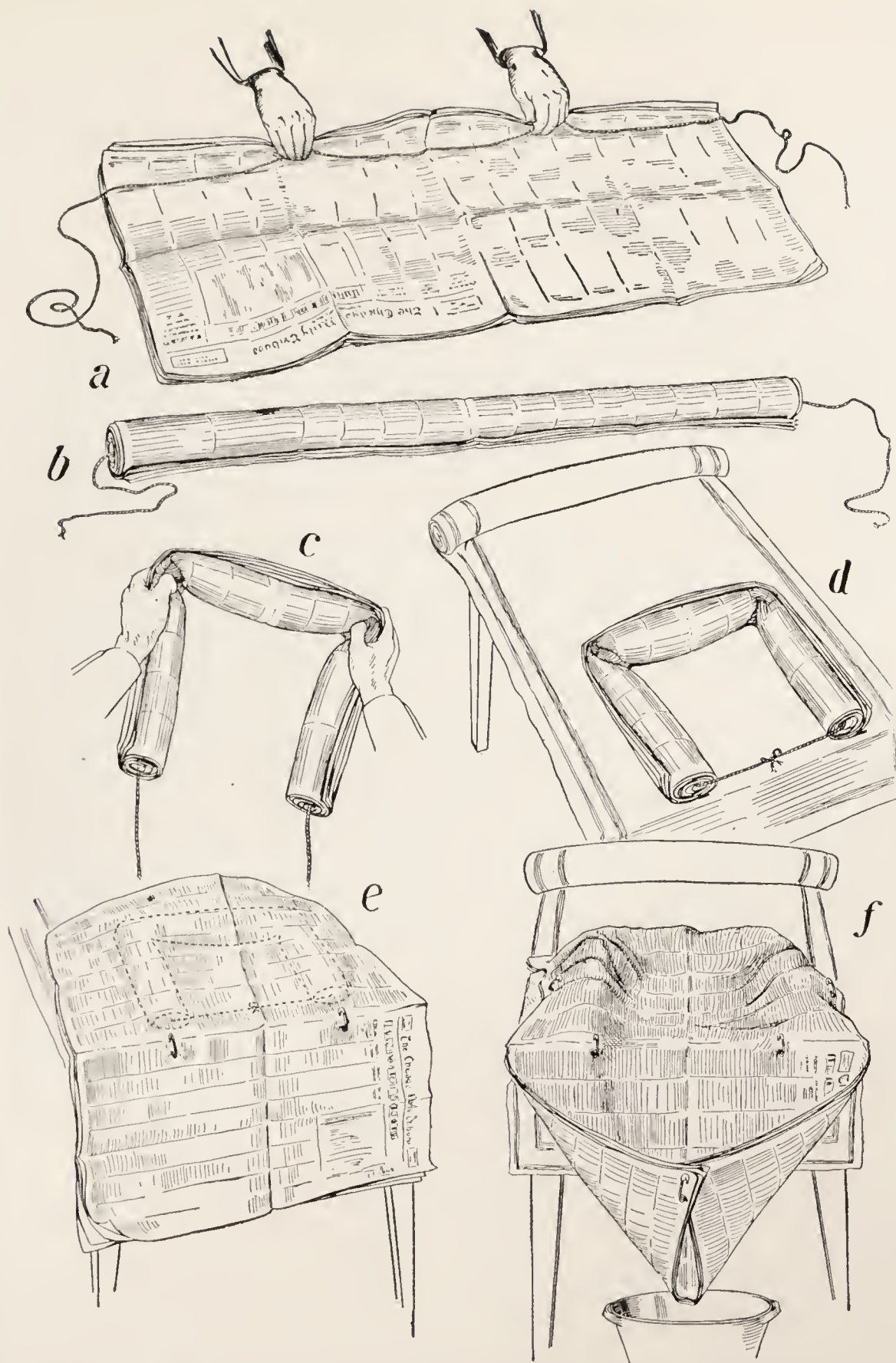


Fig. 113.—Method of making a paper Kelly pad. Several layers of newspapers are rolled around a cord (*a*), to make a roll like *b*; this is folded (*c*), tied and laid on the table (*d*); another newspaper is laid over this and pinned (*e*), and the corners fastened together to make a funnel (*f*), leading into drainage pan. Over all a clean towel or sheet is spread. Note blanket on table with end rolled up to serve as a pillow.

catheter, scissors, artery clamp, and tape for tying the cord lying in lysol solution. The other table stands on the other side in a corresponding position. It carries the pan of boiled instruments, a pile of sterilized towels, a jar of sterile pledgets, and the suture material. A kitchen chair is placed before the table for the operator (Fig. 114).

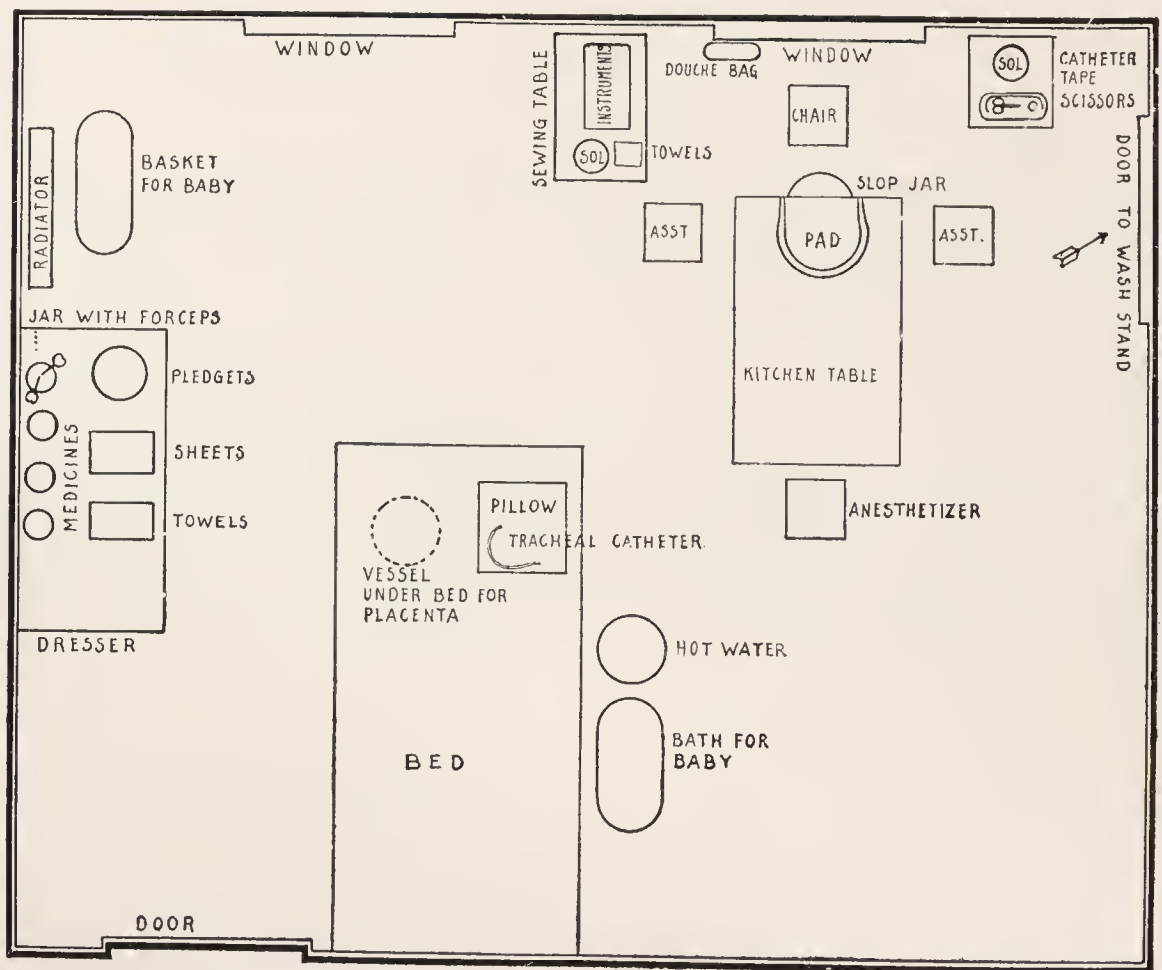


Fig. 114.—Diagram of room arranged for operation.

Preparation for Complications.—Three emergencies should be especially provided for: Asphyxia of the newborn, postpartum hemorrhage, shock.

1. In a convenient spot the nurse places a firm pillow or folded blanket, a pile of towels, some mouth wipes, the tracheal catheter (pervious and clean), a tub with hot water. The hot-water bag is wrapped in the receiver and laid on the pillow. These are all for the baby.

2. For postpartum hemorrhage she should have a hypodermic of ergot ready—also one of pituitary extract,

gauze for packing the uterus (warmed in winter), a sterile douche bag, and plenty of sterile water—hot and cold.

3. For shock, a warm bed, hypodermic medicines, sterile salt for hypodermoclysis, etc. The nurse might re-read with profit the remarks on page 137 regarding the pre-

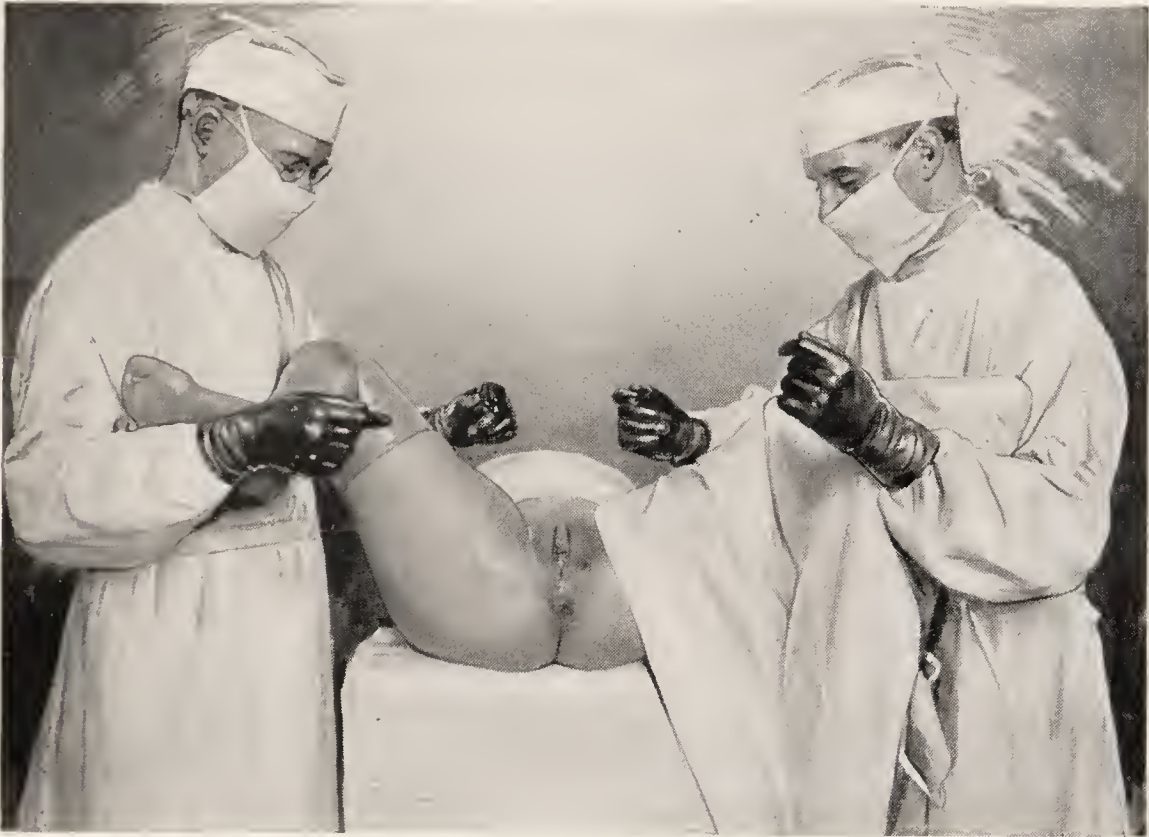


Fig. 115.—Patient in modified lithotomy position for operative delivery. The sterile sheet has been removed from the right leg to show how the assistant holds it by his forearms, leaving his hands free to help the operator. After sterile sheets are put on, even they should not be touched by sterile gloves.

vention of shock. Collapse in labor may have many causes. The nurse should be particularly watchful for it in cases of hard forceps or version (due to injury), after toxemia (heart failure) in pale, anemic women, and in little persons who have not much blood (hypoplastic states).

Preparation of the Patient.—If the woman comes to operation in the course of an ordinary labor, she is already partly prepared and needs only an antiseptic washing or painting with tincture of iodine or 4 per cent mercurochrome after she comes on the table. If the operation is an emer-

gency, the patient had better be prepared on the table, and then the ordinary surgical method is here employed—shaving carefully the hair, scrubbing with soap and water, with bichlorid 1:1500, or lysol 1 per cent, or both. Some operators use tincture of iodine. (See p. 142.) The nurse should ask the accoucheur if she is to give the patient a vaginal douche and catheterize her. Most operators dispense with



Fig. 116.—Lithotomy position with limbs supported by a sheet-sling.

douches nowadays, and catheterization is usually done after the patient is put on the table.

After the preparation, sterile leggings are put on and the body protected by a blanket and sterile sheets. The exact position a parturient should hold for operative delivery from below is shown in Fig. 115. The buttocks are brought 3 inches over the edge of the table. The legs are held in a modified lithotomy position by an assistant on each side, with one forearm on the instep of the foot and the other at the knee. They hold the legs in position by pressure

with their elbows and wrists, and do not touch the covering sheets, even though these were sterile when put on, because germs can readily pass through the mesh of sheets, and they will go through quicker by capillarity if the cloth is wet. If there is a lack of assistants to hold the legs, the patient is arranged as in Fig. 116, with a sheet supporting the limbs.



Fig. 117.—Modified Walcher position. Assistants not needed to hold legs. The chair tops must be well padded.

A large square sheet is rolled together on the bias, the middle placed around the shoulders, and the ends are tied securely around the outside of the limb just below the knee. After the knot is firmly tied, for additional security the end of the sheet is pinned. The sheet should be stretched over the shoulder, not over the back of the neck. The nurse must remember that this position is very fatiguing to

the patient, even under an anesthetic, and the limbs should be stretched out occasionally during the operation, and the sheet removed at the first opportunity after it.

Another method is the use of two chairs to support the limbs, as shown in Fig. 117.

Many women complain for days of backache and pains in the legs, the source of which is found in the cramped position held for several hours during long operations. Furthermore, some authorities hold that neuritis, phlebitis, and embolism may follow prolonged retention of the limbs in a forced position.

Preparation of Instruments.—The physician will usually select such instruments as he will need for the particular operation to be performed, but the nurse should familiarize herself with the names and appearance of those commonly used, so as to get for him whatever asked. The instruments should be boiled in a 1 per cent soda or a 1 per cent borax solution for at least twenty-five minutes before the operation. If the physician carries a pan in his satchel for this purpose, it is much better than if the nurse has to use the wash-boiler, fish-boiler, roasting-pan, or other large household utensil. In general, it is best to use as few house utensils as possible in this work. Nickeled instruments tarnish if boiled in water without an alkali. For this purpose soda bicarbonate or washing-soda is used, 1 dessertspoonful to 1 quart of water, borax in the same proportion, or a little lysol, and the pan must be tightly covered, to insure sterilization. Lists of the instruments needed for the most common operations will be found with the descriptions of these operations.

Light and Heat.—These two important factors must receive adequate attention. In the daytime the operative end of the table is put toward the window, and at night toward the center of best light. In country practice a sufficient number of good lamps, filled and trimmed, should be at hand. Bicycle and auto lamps are useful.

The room must be warmed, as the patient is often much exposed, and the child too should be given a warm welcome. When the operation is prolonged, and in abdominal work, a few warm-water bottles should be laid alongside the chest and limbs.

The bed should be warmed for the reception of the patient after the delivery, although usually there is not so much shock following obstetric operations as follows severe surgical measures.

Anesthesia.—The nurse occasionally has to administer the anesthetic, but she should always have it understood that the physician assumes the responsibility. It is best, in such cases (which, in the writer's opinion, should not occur), for the physician to put the patient to sleep and let the nurse continue the narcosis. For operations the full surgical anesthesia is employed. In justice to all concerned, an anesthetizer ought to be employed.

The face should be smeared with vaselin to avoid the unpleasant burns that may be produced by chloroform, and care should be taken that none of the latter is dropped into the eye.

In small rooms, where gas is burning and chloroform is used, the gas decomposes the chloroform and irritating vapors are liberated. These vapors are more active in the presence of steam, and they are poisonous when concentrated. Fatalities have been reported. Coughing and sore throat are the milder symptoms. To avoid these evil effects the nurse will provide free ventilation in the confinement room.

Some prefer ether as an anesthetic. While the danger of explosion from an open flame is present, ordinary care will obviate it. The mask and bottle should not be within 8 feet of the grate or less than 3 feet from the gas jet. Ether vapor is heavy and sinks to the floor.

Care After Operations.—After the delivery the physician has usually cleansed the vulva of blood, but he leaves

the nurse to clean the nates and limbs. This she does with a towel wet with warm solution, taking extreme care not to approach the perineum with the cloth or disturb any packing or stitches that might have been inserted.

The abdominal binder with T, holding the vulvar dressing, is now applied, after which the patient is removed to her bed. Great care and gentleness are required during this procedure so as not to jar the woman, and the head must be held low, so that fainting is prevented. The nurse now has to rearrange the room while the physician or his assistant watches the patient and the infant; she cannot do all three. Bloody pads, pledgets, and the placenta (the last only after the physician has inspected it) are wrapped in newspapers and sent out to be burned. Bloody towels and sheets are thoroughly rinsed in cold water and wrung dry before being sent to the laundry.

The instruments are thoroughly washed in cold water and scrubbed with a brush, especial care being given the locks, hinges, and corrugations. Then the darkened spots are scoured with damp Hand Sapolio, the instruments then scalded, and dried out of a hot lysol solution; being hot, they dry quickly and do not rust. After septic operations the instruments should be boiled for thirty minutes in an alkaline solution before being put away. Some bacteria are very hard to kill.

Care of the Child.—After operative delivery the child requires special guarding, as it is likely to choke up with mucus, or it may become cyanotic because its lungs, not having been fully unfolded (atelectasis), do not present enough air surface for oxygenation of the blood. If the infant is troubled with mucus, this should be removed by the little finger covered with a soft linen cloth. Then the child should be placed on its side, with the head lower than the chest; the mucus thus escapes from the side of the mouth. A little water may be given. It carries the mucus down with the swallowing action.

Should the infant turn blue, the case is serious and the physician should be notified. While he is coming the child may die, so the nurse must do something to save it. (See chapter on Asphyxia Neonatorum.)

The nurse may glance at the navel to see if it is securely ligated, and that there is no hemorrhage from it. If the head of the babe has been injured by the forceps, great care is required to prevent infection. In the absence of instructions from the physician the little wounds are washed with sterile water, touched with tincture of iodine, and dressed with sterile gauze sewed on the head like a cap. The physician's attention should be directed to these and other unusual conditions of the newborn. It is important that a child delivered by an operative procedure be kept especially warm, as it suffers shock. This is a fact not sufficiently appreciated.

Care of the Mother.—The usual attention given the mother after labor will suffice here unless the operation has been very difficult, with lacerations of the soft parts, or of a special nature, as symphysiotomy or cesarean section. The bed should be warmed, the uterus watched carefully for relaxation and hemorrhage; the room should be aired and darkened.

After-treatment of special operations will follow the description of same.

MAJOR OPERATIONS

The Forceps.—The forceps of obstetrics is an instrument designed to extract the baby's head from the mother's passages without injury to either. We who use it naturally and so successfully cannot appreciate the plight of the older accoucheurs when they were confronted with an obstructed labor. Version was usually impossible because they had no anesthetics to relax the uterus with, and, they, lacking a better way, tried to pull the head out by means of ribbons or cords, or nets slipped around the chin or neck, or they

attempted to pry it out with spoon-shaped levers, all indeed very similar to one's efforts to extract a cork from a bottle. If these measures failed, nothing was left but to sacrifice the child.

In 1720 Jean Palfyn, Professor of Anatomy of Ghent, Belgium, laid before the Paris Faculty of Medicine his



Fig. 118.—Jean Palfyn (1650-1730), Ghent, Belgium, invented and first published the obstetric forceps.

obstetric forceps, or "iron hands," as they were rather scornfully called. Although crude and heavy, they planted the idea and numberless modifications of the instrument soon grew out of it. It then became known that in 1580 Peter Chamberlen, of Southampton, had invented a service-

able forceps, but he and his descendants had kept it as a secret. The opprobrium of this action rests upon the family to this day.

Of the large variety of obstetric forceps, we will name only those most commonly used: the Simpson, short for low, long for high operations; the Tucker-McLane, the Naegelè, the Levret, the Tarnier axis-traction, the Milne-Murray, the Kielland, and the latest claimant for precedence, the Barton.

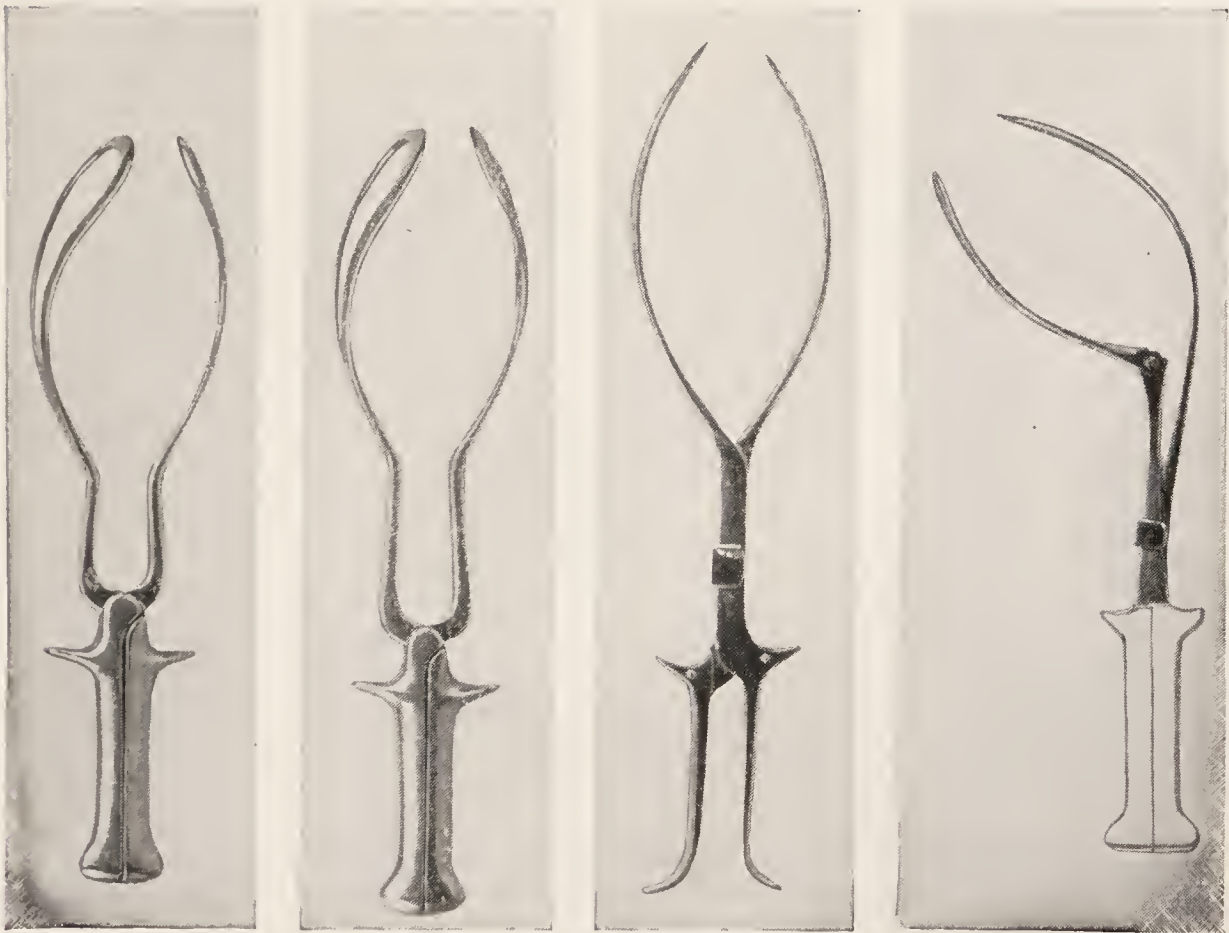


Fig. 119.—Regular Simpson; long Simpson; Kielland's; Barton's forceps.

Forceps operations are divided into three kinds: **low**, or outlet, when the head is low down on the perineum, almost visible; **mid=forceps** when the head is about half-way down the pelvis, at the level of the midplane; **high forceps**, when the head is either not engaged, or just past the inlet of the pelvis. For the high operations an axis-traction

instrument is sometimes used, since it has a mechanism which permits the pulling to be done in the axis of the birth canal. As the forceps are applied higher and higher the dangers to both mother and baby go higher. Difficult deliveries may be very bloody and inflict deep injuries on the mother's tissues—cervical and vaginal—even bladder lacerations. The baby, too, is often hurt, suffering either superficial bruises or fracture of the skull, or brain injury resulting in death from hemorrhage, or permanent cerebral disease.

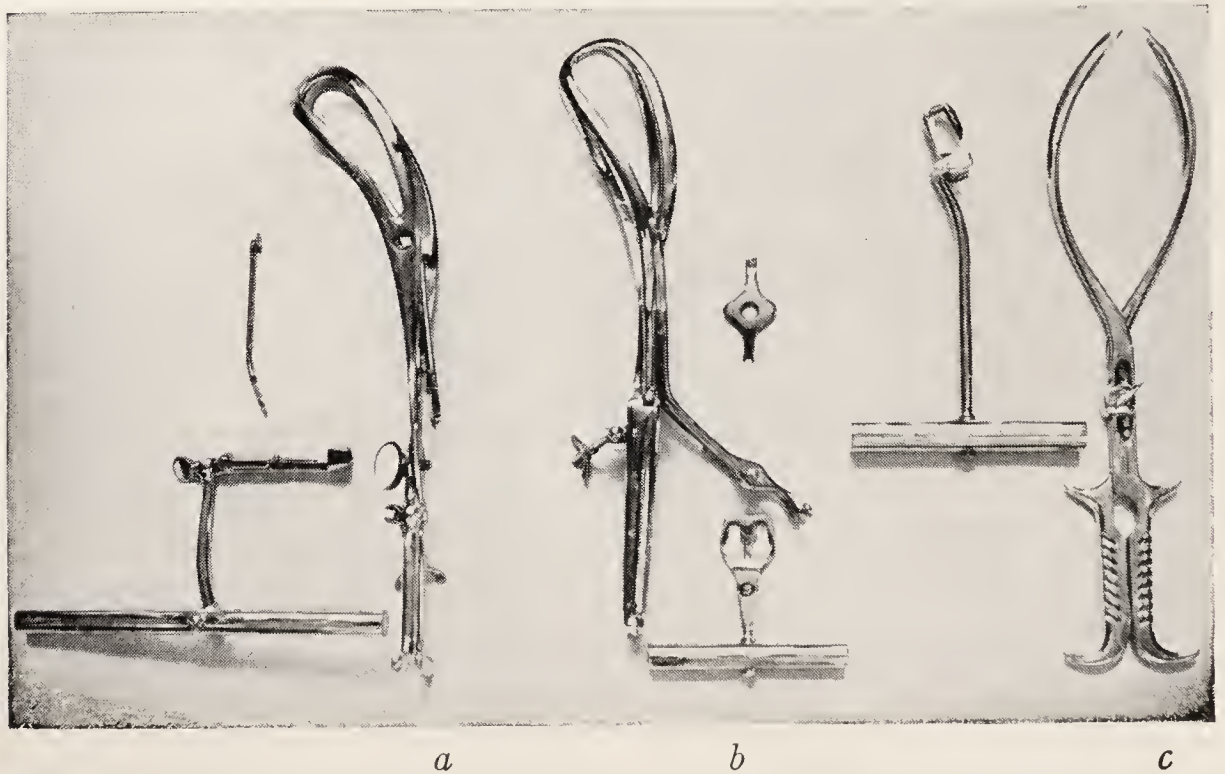


Fig. 120.—Axis traction forceps; *a*, Tarnier's; *b*, Milne-Murray's; *c*, Zweifel's.

The indications for forceps delivery are too numerous to name in detail, but they can all be placed under two heads—danger, immediate or remote, to either the mother or baby. The most common indication is delay at the outlet and, therefore, low forceps is by far the most frequent obstetric operation performed. The baby may be a little too large or the parts not so elastic and dilatable as necessary, or the woman's nervous system may prove unequal to the

strain of labor. This last is more likely in the delicately bred woman. The doctor usually lets the parturient have



Fig. 121.—These scenes are from a motion picture of a forceps case and the action should be followed from above downward. Note the application of the blades of the forceps, listening to the fetal heart beat, the performance of episiotomy and partial delivery of the head.

good “bearing down” pains for one, two, or three hours to show what she can accomplish (not to see what she can

endure) and, when he finds that progress is arrested, he lends her the aid of art. Nowadays we seldom wait more



Fig. 122.—Note the removal of the forceps, the delivery of the head by means of pressure with the fingers, the external restitution, the delivery of the shoulders by gentle traction and the care of the umbilical cord. Follow the action from above downward.

than two hours of good second-stage pains because of three dangers: first, exhaustion on the part of the mother

which may have immediate effects or even weaken her for life; second, the baby may become asphyxiated (indi-



Fig. 123.—Instruments for forceps operation. The surgeon selects the obstetric forceps (see Figs. 119 and 120). Note tracheal catheter and head stethoscope.

cated by slowed or irregular heart tones, the passage of meconium, and the development of a large caput succeda-

neum), and third, too long pressure of the head on the soft parts may cause sloughing and vesicovaginal or other fistula.

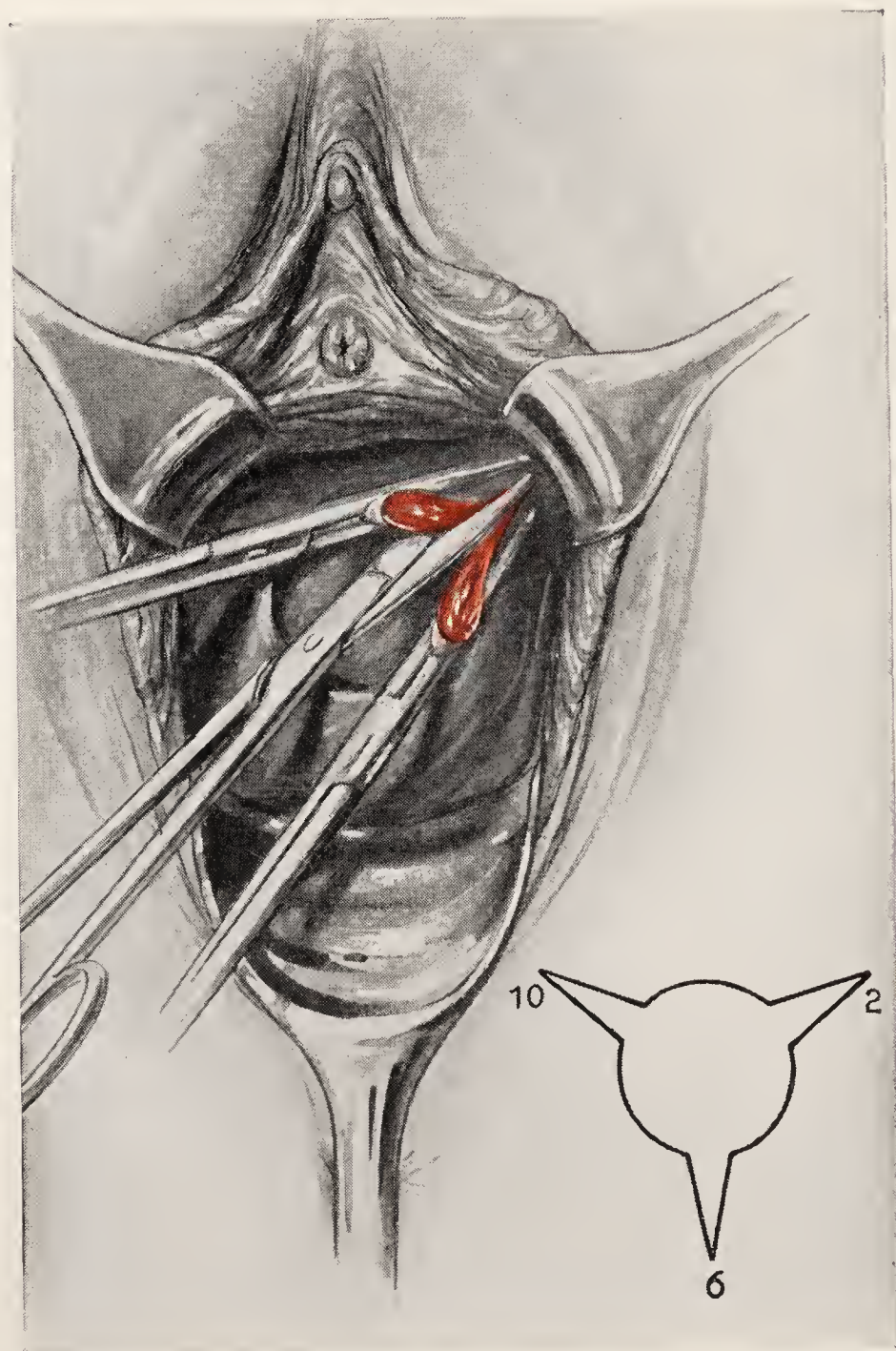


Fig. 124.—Duehrssen's incisions. Under wide exposure of the field by broad specula the cervix is grasped and cut between two 8-inch forceps which are left on a few minutes to stop hemorrhage. The author usually makes three incisions corresponding to the 10-2-6 of the clock, and cuts to the fornices vaginae.

Another indication for forceps is delay due to insufficient rotation of the head. We call these cases "deep transverse

arrest," *i. e.*, the occiput is stopped in the course of anterior rotation in the transverse diameter of the pelvis.

A large group of complications occasions the frequent necessity of interference. Sometimes acute emergencies demand the use of forceps—such as asphyxia of the child *in utero* from compression of the cord or premature detachment of the placenta, and sometimes conditions which imperil the mother, such as eclampsia, heart failure, pulmonary edema, hemorrhage.

Most accoucheurs prefer to wait until the uterus is fully dilated before applying forceps (or "instruments"), but if the necessity is acute the cervix is first enlarged by manual dilatation, by bags, or "Duehrssen's incisions"—*i. e.*, cut in radiating directions, for which operations the nurse should be prepared.

LIST OF INSTRUMENTS FOR FORCEPS OPERATION

Two pairs of obstetric forceps, ordinary and axis-traction, as ordered.

Two long artery forceps.

Six short artery forceps.

Two vulsella; four Allis forceps.

Two tissue forceps.

Three scissors (one long).

Two needle-holders, six needles.

Three perineal retractors, or specula.

One long uterine packing forceps. (See Fig. 142.)

Suture material: silkworm-gut or catgut, as ordered.

(See chapter on Sterilization of Supplies.)

One catheter (soft rubber).

Stethoscope.

If Duehrssen's incisions are to be made add four 8-inch clamps, one 8-inch scissors with rounded points.

Two tracheal catheters for aspirating mucus from trachea; these must be sterilized otherwise than by boiling.

The supplies, as sheets, towels, gowns, sponges, basins, pitchers, etc., required are identical with those needed for normal labor.

Duties of Nurse During Forceps Operation.—The nurse, having prepared everything as described, and having enough help, will only need to wait on the operator, handing him such things as he needs. She need not have absolutely sterile hands—in fact, had better not be expected to touch aseptic things. When necessary to replenish basins, she should touch only the outside; when necessary to supply sponges, she carries them with a sterile dressing forceps. For this purpose she provides a tall, wide-mouthed jar, with a 1 per cent lysol solution, in which the forceps stand when not in use. (See Fig. 267, p. 584.) It is remarkable what dexterity a nurse acquires in handling sterile towels, pledgets, etc., with the long dressing forceps.

In a maternity the nurse “scrubs up” just the same as for a laparotomy, and her duties are the usual ones plus those of the obstetric case.

When the child is born, she hands the doctor wipes for the eyes and throat, as directed under Normal Labor. Now she may have to watch the uterus. The duties much resemble those required at a normal confinement.

During difficult high forceps deliveries, and also when in breech deliveries the after-coming head gives trouble in passing through the pelvis, the patient is sometimes ordered put in the Walcher position (Fig. 125).

The Walcher Position.—This attitude of the patient cannot be held long, as it is very fatiguing. It is sometimes used during labor to facilitate the engagement of the head as it enlarges the inlet a little. The nurse allows the legs to fall very slowly and gently toward the floor, until they rest in the position shown in Fig. 125. The sacrum must rest just on the end of the table, which is protected by a soft blanket; the back arches up, as can be seen in the illustration; the shoulders rest on the table. The legs are

held securely, so that the patient does not slide off the table. As soon as the head is well down in the pelvis, the legs are put back into the pose they have in Fig. 115.

Breech Extraction.—In some breech labors, in spite of powerful pains, the breech will not come down, and the



Fig. 125.—The Walcher position.

doctor finds it necessary to help nature deliver the child. As in forceps, the child may be a little too large, or the maternal parts a little too small or too rigid, or some acute danger threatens the mother or baby.

The accoucheur, after the same preparations as for any major operation, folds the hand into a narrow cone, inserts

it into the uterus, grasps a foot, and gently draws this down into the vulva. Now, by steady traction, the infant is drawn out, first by one foot, then by the leg, then by the thigh, then aided by drawing on the other leg, proceeding carefully. The shoulders sometimes cause great difficulty, and the operator throughout has a great task to avoid fracturing the bones. When the head is to come two fingers are inserted into the child's mouth; the other hand is curved fork-like over the shoulders, the finger-tips resting on the sternum, and, aided by an assistant pressing from the outside over the uterus, the head is delivered. (See Fig. 110, p. 255.)

The instruments necessary for breech extraction are the same as those for forceps operation, as it is sometimes necessary to apply the forceps to the after-coming head, and frequently lacerations are to be repaired.

Version.—This means turning the child from an unfavorable presentation to a favorable or normal presentation. In "cephalic version" the head is brought over the inlet, usually by external manipulation. It is used sometimes in breech cases late in pregnancy to avoid the dangers of a breech delivery. In "podalic version" the breech is brought down, and this form is usually meant when we speak of version. It is done by combined external and internal manipulation. "Braxton Hicks" is also a combined version and is practised when the cervix will admit only two or three fingers.

The common indications for version are: shoulder presentation, placenta praevia, prolapse of the cord, and when one must deliver the baby quickly and the head is too high to be successfully grasped by the forceps. The operation is often difficult and laborious, and sometimes very dangerous. The child is often lost by the untimely detachment of the placenta, and the uterus is sometimes ruptured in the effort to turn the child. Rupture of the uterus is a sad accident, as even with the best treatment over 60 per cent

of the mothers and 98 per cent of the children die. The preparations for version are the same as for the forceps operation, and to the instruments should be added two Version Slings. These are of $\frac{1}{2}$ -inch tape and each 1 yard long; they are applied around the leg or arm which has been delivered, so as to aid subsequent extraction. For version, breech extractions, and forceps some operators lubricate the parturient canal with sterile tincture of green soap or jelly.

Destructive Operations.—Cesarean section, pubiotomy, version, and the forceps operation have become so highly perfected and, what is more to the point, the standard of obstetric practice has been raised so much that the destroying of a living child to effect its delivery has become one of the rarest obstetric operations. The mutilation of the viable child has been the opprobrium of the obstetric art for centuries, and the heartfelt hope of the accoucheur, to be able to abolish embryotomy on the living entirely, may soon be realized.

When the child is dead sentimental reasons against mutilating it in order to effect delivery should not prevail, because usually the mother is injured less when the baby is first reduced in bulk, and then brought through the birth canal. Such possibilities are: neglected shoulder presentation, prolapse of the cord, head retained in breech presentation, sepsis in labor, hydrocephalus, and other monsters.

The question of embryotomy when the child is living and viable almost never comes up nowadays. Always the life of the fetus has been so compromised by protracted labor and interference with its oxygen supply, or its head has been so severely crushed by unsuccessful attempts at delivery with forceps, that it is in a dying condition when the operation is performed.

The conditions which usually lead to this difficulty are those of mechanical disproportion between the baby and the maternal parts. The baby is too large or the parts (pelvis or soft passages) are too small. If the patient cannot deliver herself, and if labor cannot be accomplished by forceps or by extraction by the breech, the questions arise, Shall we reduce the bulk of the infant, or shall we remove the child by a new passage (cesarean section), or shall we enlarge the pelvis (symphysiotomy)?

The last two operations are quite safe if performed very early in labor, before the patient is infected or exhausted. If performed late, when either infection or exhaustion is present, the mortality is very high, while the craniotomy has hardly any mortality.

The decision in such cases is a painful responsibility, one which the physician usually calls upon the family to share. The nurse should remember that in Catholic families mutilating operations on the living child are not sanctioned and she should suggest that the priest be summoned to assist in the deliberations. If the conditions are dis-

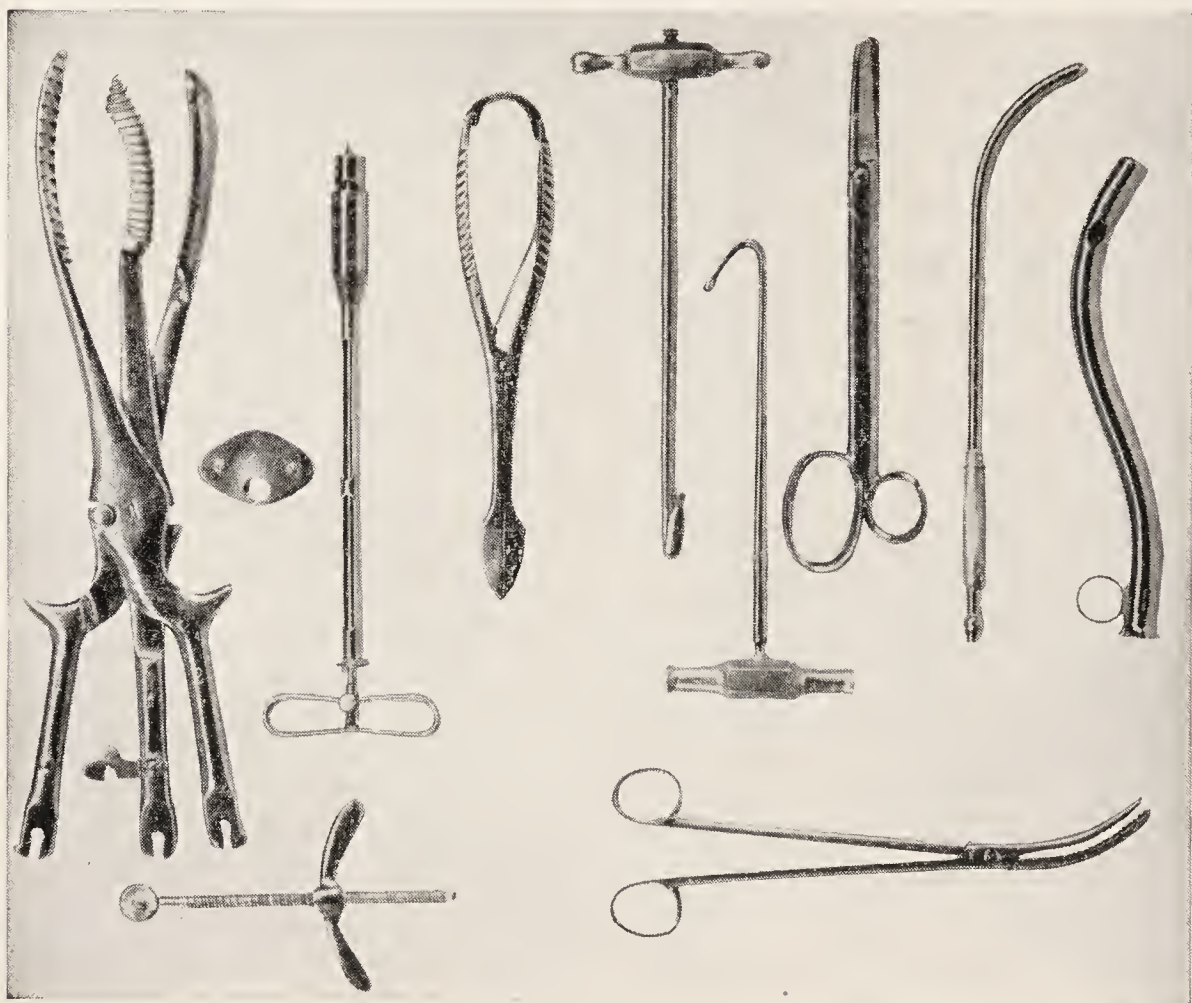


Fig. 126.—Instruments for embryotomy: Modified Zweifel cranioclast and (when the perforated plate is used) cephalotribe; Martin trephine; Naegelè perforator; Braun decapitation hook; author's shoulder hook; decapitation scissors; strong irrigator tube; brain evacuator; right lower corner, Mesnard-Stein bone forceps.

tinctly unfavorable for a cesarean section or pubiotomy, there is great consolation in the conviction that the child would not have survived the injuries it suffered before delivery.

Decapitation.—When a labor in which the child presents transversely, that is, a “cross-birth,” is allowed to go on and has become neglected, the child is found wedged into the pelvis so that it cannot be turned or straightened out so as to be extracted lengthwise. These cases are called “neglected transverse presentations,” and are very formidable. In such emergencies the accoucheur is compelled to cut

the dead child into two parts and deliver each separately. The section is usually made at the neck, but sometimes the trunk is divided. The neck is divided by means of strong seissors or a blunt hook invented by Carl Braun. It is a horrible operation, and fortunately rare.

Craniotomy.—This is another of the mutilating operations on the fetus, and consists of opening the skull of the infant with sharp seissors or a long trephine, evacuating the brain matter, then crushing the bones together so as to reduce the size of the head, and extracting it after this reduction in size. *Embryotomy* is a term used to designate all the mutilating operations on the child. *Cranioclasia* means the crushing of the child's head, and *cephalotripsy* the same, but without opening the skull.

Preparation for the Mutilating Operations.—The nurse will prepare for craniotomy, decapitation, and the other operations of this class as for any major obstetric operation. The instruments are shown in Fig. 126. After the child is delivered the head should be reshaped by filling it with cotton and sewing up the injured skin. The feelings of the family should be spared as much as possible.

Baptism.—If the family is Catholic, the nurse, unless the physician has attended to the matter, should arrange for the baptism of the child when the possibility presents that it will die. The physician may give the child intra-uterine baptism, using sterile water.

Even a non-Catholic may administer these rites, and the nurse will do much for the mental comfort of her patient if she sees that her religious beliefs are conformed with. Through the kindness of the Most Rev. George W., Cardinal, Mundelein I am enabled to publish the ritual.

THE MANNER IN WHICH A LAY PERSON IS TO BAPTIZE IN CASE OF NECESSITY

Pour common water on the head or face of the person to be baptized, and say while pouring it:

"I baptize thee in the name of the Father, and of the Son, and of the Holy Ghost."

N. B.—Any person of either sex who has reached the use of reason can baptize in case of necessity.

Cesarean Section.—This operation (the removal of the child through the abdominal wall), does not take its name from Caesar, but from a Latin word, *cedere*, meaning to cut. There is no evidence that Caesar was delivered by this means. He wrote letters to his mother from France and in those days section was done only on the dead. Ancient Egyptian and Jewish custom commanded that the mother be not made the coffin of the child, and the Lex Regia of Numa Pompilius, seven hundred years before Christ, ordered the child's removal before the burial of its mother in the hope of saving its life. It is known that Jewish physicians long before Christ performed successful cesarean sections on living mothers, but the first fully described operation on the living was performed about three hundred years ago by a swine-gelder on his own wife. Thirteen midwives and barbers had exhausted their skill on the poor woman. She recovered! The scene of a modern cesarean section differs from that of one given by Mercurio in Italy in 1595 (Fig. 127).

Delivery by the abdominal route is performed when the maternal passages are so obstructed—as by contracted pelvis or scars in the soft parts, or by tumors, such as fibroids, wedged in the pelvis—that the child has no room to pass. Sometimes there is room enough for a child that is reduced in size by mutilation to pass through, but not for a living child. In these cases the physician may do the abdominal delivery to save the child. Placenta praevia, eclampsia, heart disease, prolapse of the cord are occasional indications for cesarean section. Nowadays the operation has become so safe that some accoucheurs perform it to spare the baby the risks of a hard delivery and the mother the consequent lacerations.

The operation consists of seven steps: (1) Opening the abdomen; (2) incision in the uterus; (3) removal of the child; (4) removal of the placenta and secundines; (5) careful suture of the uterus; (6) peritoneal toilet; (7) suture of the

abdominal wall. Sometimes the uterus is removed also. This is called a Porro operation, and is done either to prevent infection or to enable the operator to remove tumors, or to stop further childbearing.



Fig. 127.—A cesarean section in Italy in the sixteenth century (Witkowski).

An elective cesarean is one that has been decided upon beforehand and a time set for the operation either a few days before the term, or at the very moment labor declares itself. The mortality of such cesareans, in skilful hands, is less than 1 per cent for the mother and nothing for the

child. Performed late, after many examinations have been made by questionable fingers or after operations have even been attempted, cesarean section is often followed by peritonitis and death, and the children also often die, so that even if the mother lives the object for which she has been hazarded is lost in the end. It is prenatal care which early discovers the abnormalities that demand abdominal delivery, and the nurse may again see why it is so beneficial.

Preparation for Cesarean Section.—A preparatory course of treatment extending over several days is desirable, but not absolutely necessary. Daily warm baths with brisk scrubbing of the trunk from the ensiform to the knees, a few mild enemata, plain nourishing food, plenty of rest in bed, and walks in the sunshine are all valuable in rendering the patient more resistant to the dangers besetting the operation. The urine is examined for evidences of nephritis, and the vaginal discharge, for gonorrheal infection. An x-ray picture is taken if there is time as the baby may be a monstrosity. The preparations for this operation are mainly those for laparotomy in general, and in a hospital the usual technic is followed. In addition, provision is made for the child and its heart-beat is to be counted just before operation.

At the home cesarean section is very seldom performed, but the nurse should know how to prepare for it just as well. Nowadays, with the automobile and hospitals distributed over the country, it is nearly always possible to obtain dry sterile supplies for an operation at home, but if the nurse has to meet an emergency it can be done very simply and successfully if the surgeon and his assistants will but remember the strict limitation of the field of asepsis.

Preparation for Emergency in the Home.—Six sheets, 18 towels, and 12 handkerchiefs are hung in a wash-boiler, tightly covered, boiled vigorously for one hour, the water drained off, and set aside, still covered, to cool. (See p. 563.) The instruments, 6 pairs of rubber gloves, 4 well-

scrubbed basins, 4 large bread pans or platters, and 4 dinner plates are boiled, with baking soda, in another large boiler. A full kettle of boiling hot and one of cold sterile water are also provided.

The room is arranged as in Fig. 128. The table tops are scrubbed with soap and water and then with 1:1000 bichlorid.

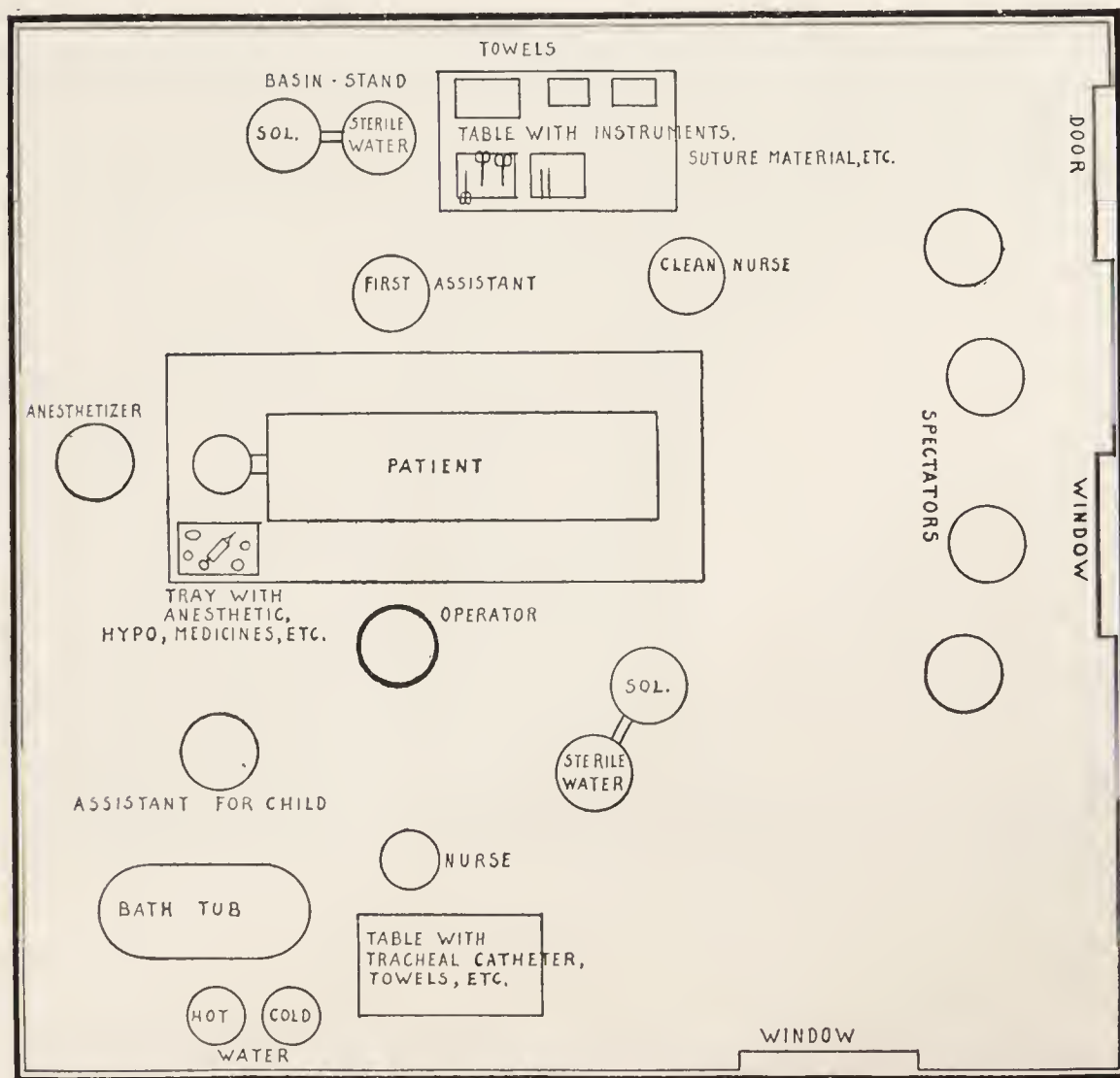


Fig. 128.—Diagram of a room arranged for cesarean section.

At the operation the tables are covered with boiled towels, the bread pans and platters are used for the instruments and sutures, the sheets protect the field of operation, the towels and handkerchiefs are the laparotomy sponges. (Be careful of the sponge count!)

The nurse can be of more assistance if she is not "scrubbed up." The surgeon then arranges the sterile supplies, threads his needles, and sets out the instruments himself while the patient is being anesthetized.

The method of disinfection of the skin varies with different practitioners. The one now used at the Chicago Lying-in Hospital is as follows: (1) Shaving, from ribs to half-way

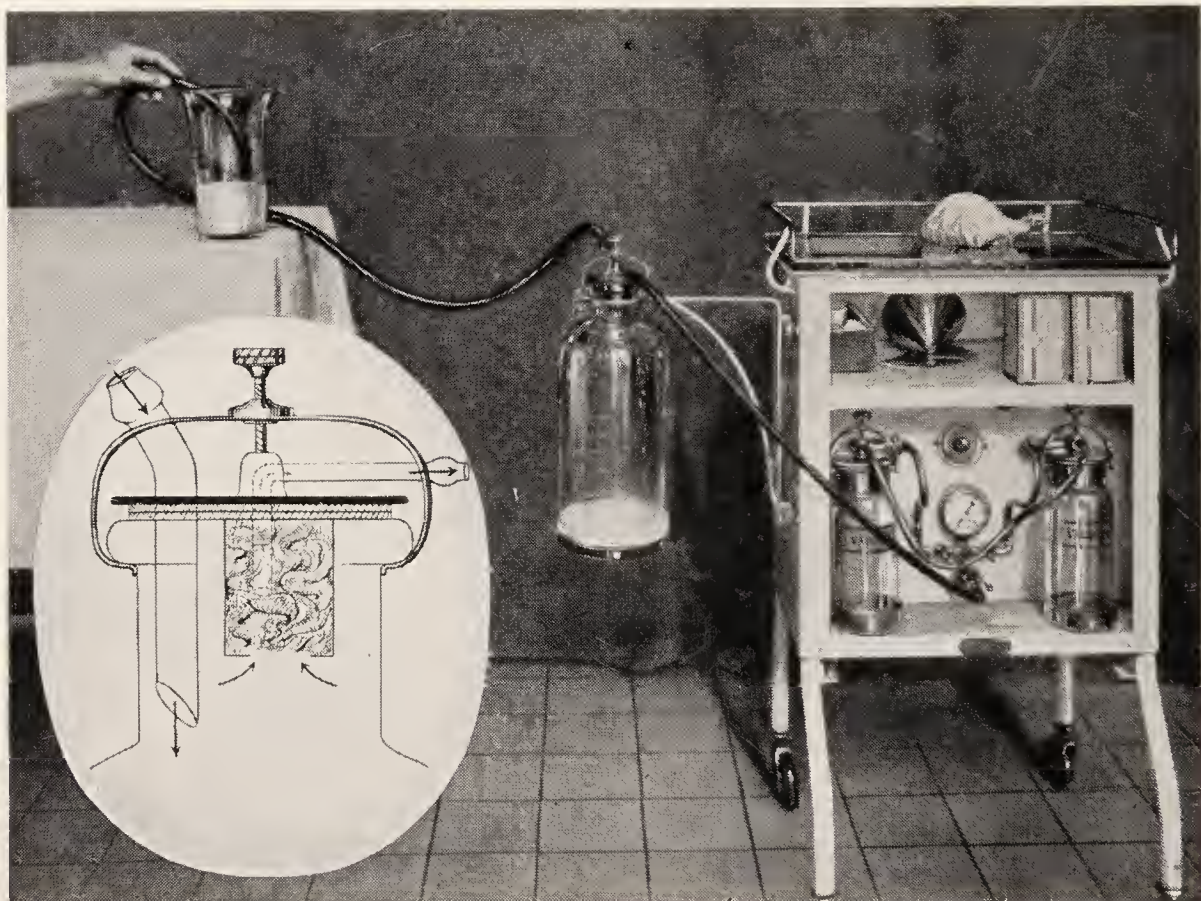


Fig. 129.—Aspirator pump for use at cesarean section. The "spill" is thus removed from the field. Detail of sterile air filter, at left. This precautionary filter removes bacteria and foreign matter (oil, etc.) from the air should, by accident, the pump action be reversed.

to knees, and well down the flanks, done in the early morning of day of operation; (2) scrubbing with soft cloth and tincture of green soap for five minutes; (3) rinsing with sterile water; (4) scrubbing with $\frac{1}{1500}$ bichlorid for two minutes, not rinsed; (5) scrubbing with 65 per cent alcohol for two minutes, not rinsed; (6) sterile towel to cover the abdomen until the operator is ready; then (7) the abdomen

is painted with 50 per cent tincture of iodine, and (8) washed with 65 per cent alcohol. The sterile laparotomy sheet is now adjusted. Some operators use alcohol entirely as a disinfectant; some, alcohol and acetone, 40 per cent; others rely on tincture of green soap or tincture of iodine or 2 per cent mercurio-chrome. The vulva is also prepared (omitting the use of alcohol and iodine). Vaginal washings are not made unless ordered. Now patient is catheterized.

For the operation five assistants are necessary: An anesthetizer, a first assistant, an assistant to hand instruments and sponges, one to receive and revive the child, and a nurse, not aseptic, to handle supplies and render general services about the patient. The less the number of hands in the case, the better. All assistants should wear masks and sterile rubber gloves, and extra care is to be taken that there are no perforations in them. Be sure to have a place for the baby.

SUPPLIES FOR CESAREAN SECTION, HOSPITAL

Twelve small laparotomy sponges. These are of four thicknesses of gauze, 9 by 18 inches, sewed around the edges and carrying a loop of tape 10 inches long firmly fastened to one corner, with a ring or hard object attached to the end.

Six large laparotomy pads. These are of six thicknesses of gauze, 18 inches square, sewed and tacked, with tapes also.

One jar of small surgical gauze sponges or pledgets (counted).

One sterile receiver for the baby.

One laparotomy sheet.

One rubber laparotomy sheet.

Two plain sterile sheets.

One dozen towels.

One pair leggings.

Six gowns and mouth- and head-pieces.

Six pairs rubber gloves.

Five basins.

Sterile salt.

One pitcher, besides hot- and cold-water supply pitchers.

These articles are sterilized by the usual methods. The antiseptic solutions are prepared according to the physician's usual practice.

THE INSTRUMENTS FOR CESAREAN SECTION

Two scalpels.

Three scissors, one angular.

Four vulsellum forceps.

Twelve artery clamps.

Eight long pedicle clamps.

Two needle-holders.

Two broad retractors.

Two rat-toothed tissue forceps.

One long uterine packing forceps.

Eight full curved round needles, $1\frac{1}{2}$ inches, for uterus.

Six shorter, half-curved spear-pointed needles for fascia.

Intestinal needles.

Two long straight needles for skin.

One glass hypodermic syringe with 1-inch needle.

One dozen large safety-pins.

Pituitrin in glass ampules.

Suture material. No. 2 catgut for the uterus; No. 1 catgut for the peritoneum; No. 2 catgut for fascia, and medium silkworm-gut for the skin, are usually used. Some operators use silk for the uterus. Ask the physician about this and the instruments.

Light, Heat, and Anesthetic.—Special arrangement must be made for light if the section is to be performed in a private home. The room must be quite warm—at least 80 F.—as the peritoneum is much exposed, and it is well that the air be damp, so that there is no dust. The operating table should be covered with an electric heating pad, or a few hot-water bottles laid alongside the patient. She must be guarded from chilling. Just before the anesthetic is started an injection of gynergen is given deep into the outer thigh muscles (see Fig. 76), and immediately the child is delivered one of pituitary is administered into the deltoid muscle. The author also gives, routinely at this time, $\frac{1}{4}$ grain morphin and $\frac{1}{200}$ grain scopolamin.

The Operation.—The field having been prepared, the sterile sheet and towels being arranged and pinned, and the anesthesia complete, a long incision is made in the middle

line. The operator rapidly cuts into the upper portion of the uterus, delivers the child by the feet, clamps the cord

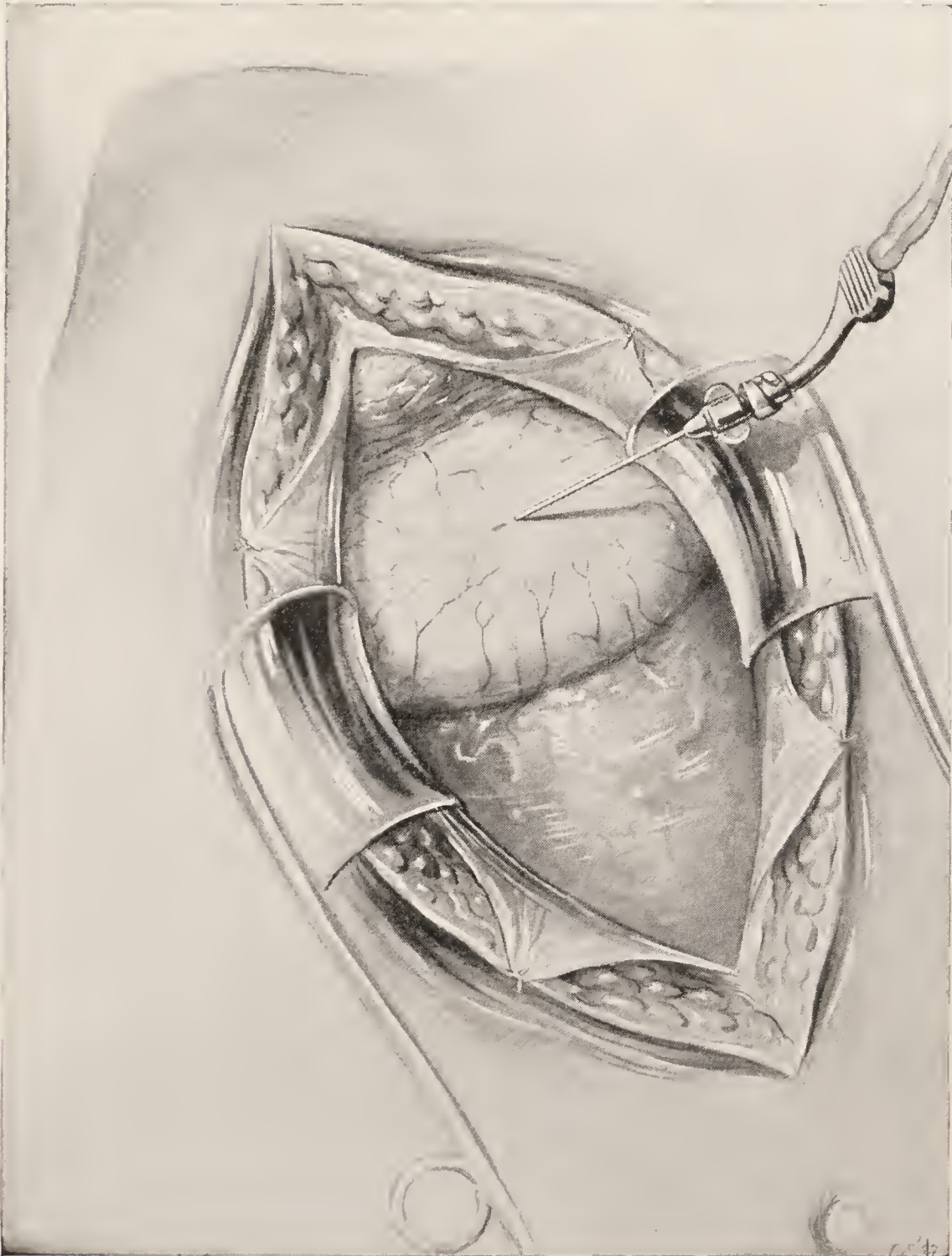


Fig. 130.—Injecting novocain under the bladder while doing the low cervical cesarean with local anesthesia.

in two places, cuts between, and hands the infant at once to an assistant or a nurse who stands beside him holding a

sterile receiver for it. The operator pays no attention to the child, as he has to continue the operation, but the assistant's duty is to revive the infant. The child usually is slow in beginning to breathe, because the change from intra- to extra-uterine conditions came so quickly. Patience and the usual methods of resuscitation almost always succeed. (See p. 480.)

The operator removes the placenta and membranes, and then covers the uterus with the large laparotomy pads or hot towels. The temperature of the salt solution from which these towels are wrung should be 102 F. The uterus, if it is not removed by the Porro operation, is now carefully sewed up again, then the peritoneal toilet is performed, and the abdomen is closed. The nurse has carefully counted the laparotomy pads and sponges and notified the operator at once if any are missing. The wound is dressed with gauze. An antiseptic powder may be used, and over this a large exclusive dressing.

Adhesive straps are now placed to support the abdominal wall, but care is to be taken not to make them too tight.

The Newer Cesarean Section.—The above description applies to the old, the classic, or, as it is sometimes called, the conservative section. Two new cesareans have been introduced for which many advantages over the old are claimed. They are the *low cervical intraperitoneal*, for which

STEPS OF OPERATION

OPERATOR.	NURSE.
1. Puts on gloves.	1. Adjusts sheets.
2. Incision in skin.	2. Hands knife to operator, artery clamps to assistant.
3. Incision of fascia.	3. Second knife to operator.
4. Incision of peritoneum.	4. Scissors to operator, tissue forceps to assistant.
5. Incision of uterus and delivery of child.	5. Two artery clamps for cord. Sterile receiver for infant.

- | | |
|-----------------------|---|
| 6. Hemorrhage. | 6. Use one large pack, insertion of packing into uterus, uterine material. |
| 7. Suture of uterus. | 7. No. 2 catgut or No. 6 silk or round gutted needles. |
| 8. Peritoneal folds. | 8. Small pack with wire suture and suture, or wire suture in uterine folds. |
| 9. Sewing peritonium. | 9. No. 1 catgut or wire needles. Crane pack. |
| 10. Sewing fascia. | 10. No. 2 catgut or sharp gutted wire needles. |
| 11. Sewing skin. | 11. Silkworm or linen or any straight needle. |

the author has suggested the name, *laparotriphorectomy*, and the *low cervical extraperitoneal*.

In the *low cervical intraperitoneal operation* the opening of the abdomen is just above the pubis, the bladder is pushed down, off the lower uterine segment, the child delivered, then the bladder sewed back in place. In the *extraperitoneal cesarean section* the peritoneal cavity is not opened at all. The incision is made just above the pubis, or along Poupart's ligament, the peritonium is carefully dissected upward off the bladder (which is displaced to one side), and off the lower uterine segment. The child is then delivered and there is no chance for the infected liquor amnii or mœrium, etc., in the uterus to gain access to the general peritoneal cavity, and set up peritonitis. It is a difficult operation and seldom performed, because the intra- or transperitoneal method gives equally good results and is simpler. The new operations are believed by many to be safer than the classic and since they may be performed in cases where the latter cannot—i. e., long labor, after attempted forceps—they are rapidly gaining recognition in America.

The preparations for the new operation are the same as for the old one, but the nurse should add the following: 2

pairs of obstetric forceps; 8 Allis or other form of vulsellum forceps; 2 short broad retractors; uterine packing gauze. The patient should be catheterized and the catheter left in place. The Trendelenburg position is used.

The After-care.—This is identical with that of all laparotomies. The nurse watches for signs of internal hem-

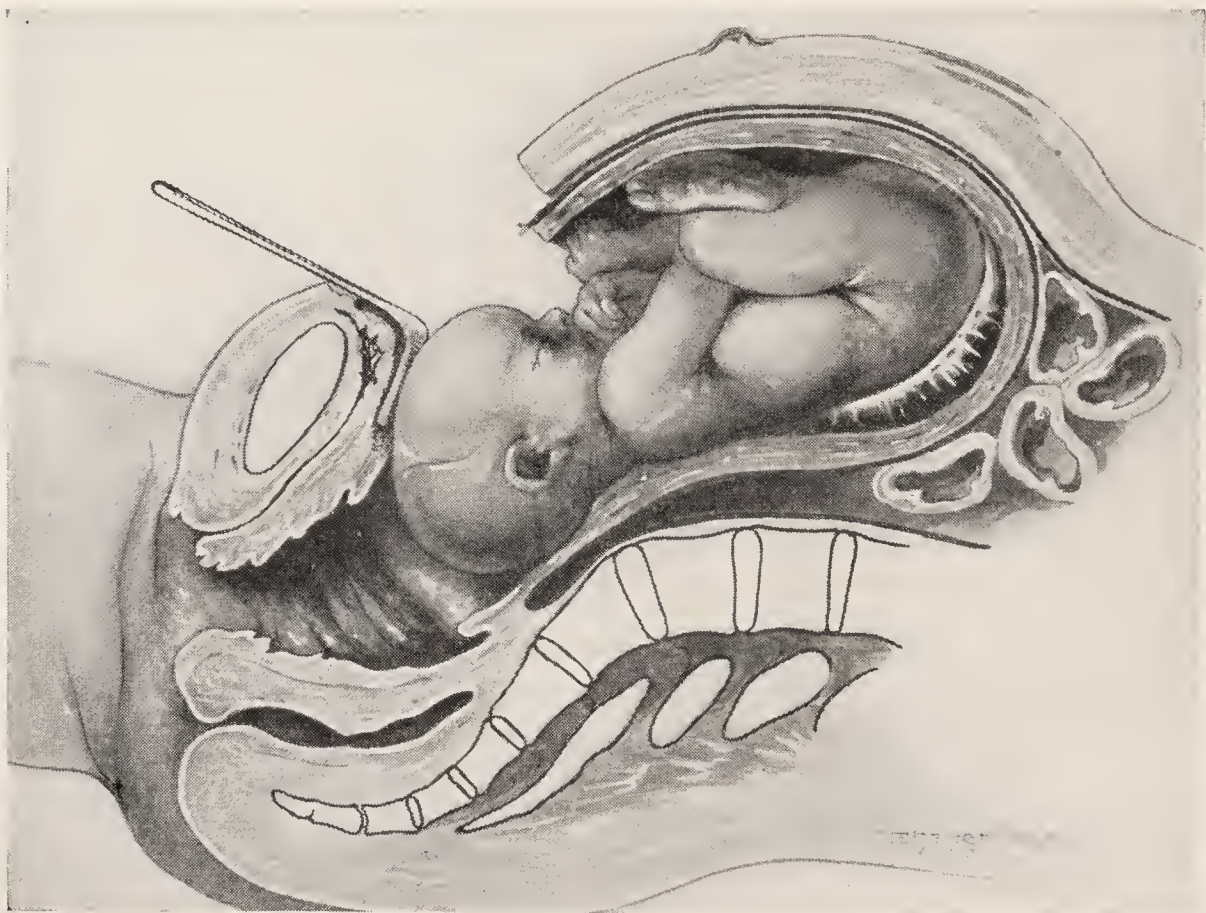


Fig. 131.—The low cervical cesarean section. Shows the opening, low in the uterus near the bladder.

orrhage, increasing pulse-rate, decreasing fulness of pulse, pallor, rapid respiration, yawning, sighing, etc. The reaction from shock should be noted, likewise its absence. In hot weather the patient must not be covered too much. Profuse sweating is not good—the tissues are dehydrated and thirst augmented. Persistent vomiting is always suspicious. In addition to these the nurse must look for external bleeding from the genitals, as patients may have postpartum hemorrhage after cesarean section. The abdo-

minal dressing occasionally requires some adjustment that it does not slip and expose the wound. The binder is pinned at the side not over the middle because putting in

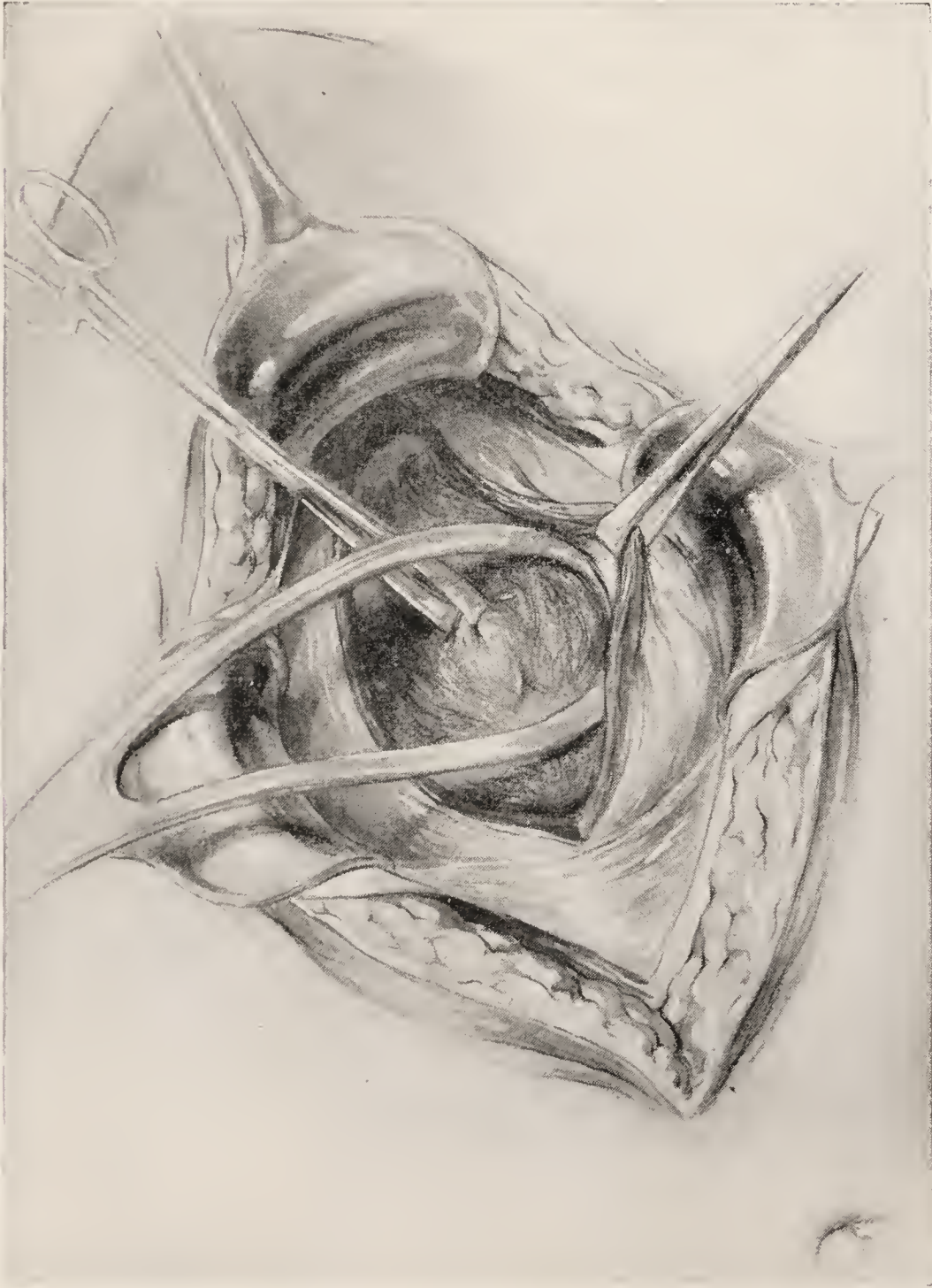


Fig. 132.—Low cervical cesarean section. Holding cervix open to admit forceps blade.

and taking out the safety pins hurts the patient (Fig. 134).

Should the patient vomit persistently; should hemorrhage appear externally; should the patient not rally quickly

from the shock of the operation or should this even deepen; or should internal hemorrhage be suspected, the physician must be notified without delay.

The author gives routinely per rectum by the rapid drip method immediately upon return from the operating-room 2 liters of normal saline solution.

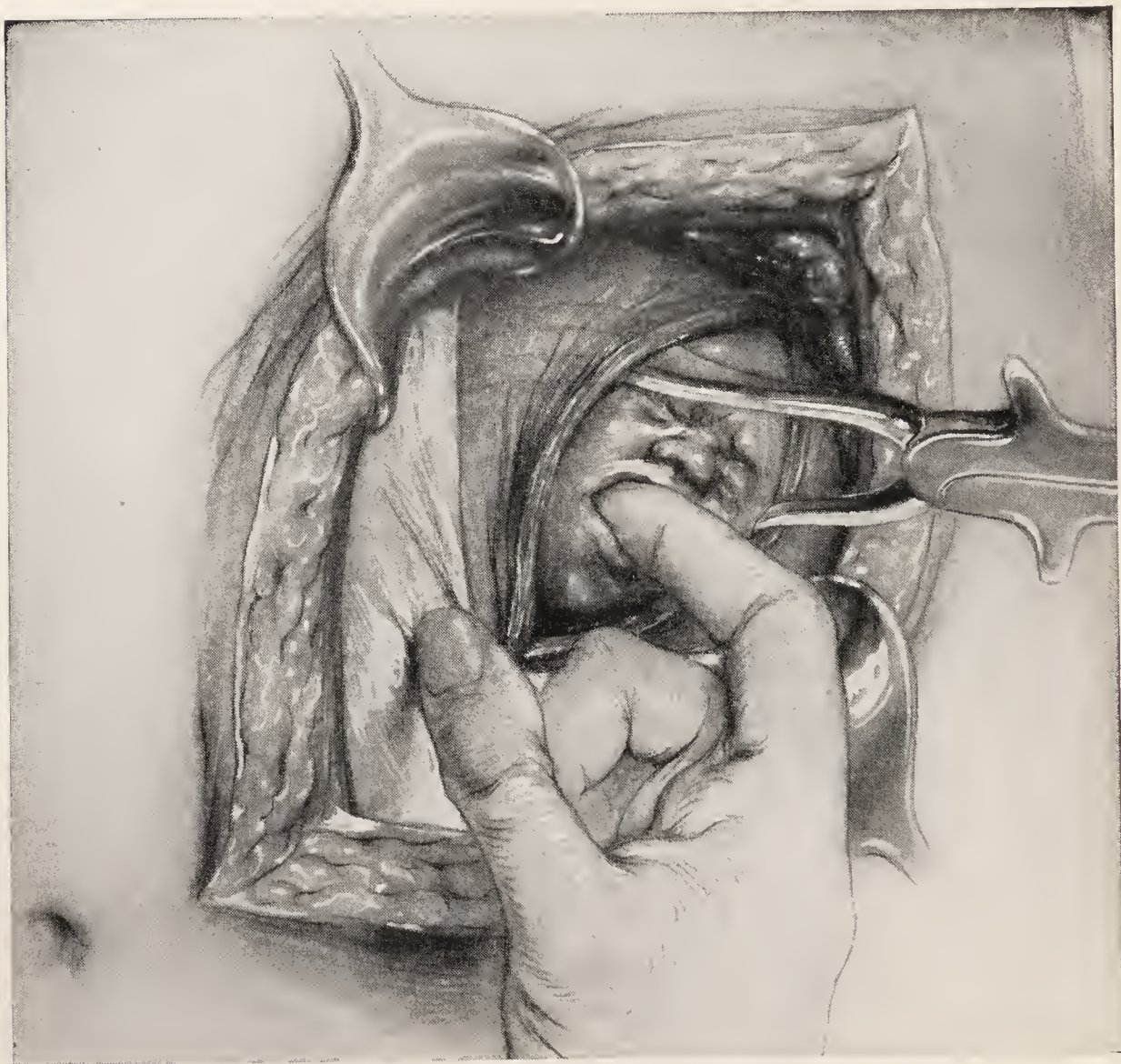


Fig. 133.—Delivery by forceps.

Hot water, 1 ounce at a time and freely, will assuage the extreme thirst, and salt solution per rectum, 1 pint every six hours, will help to do the same. Weak hot tea with sugar and a dash of lemon juice, or if patient prefers, orange juice with sugar are given for the first twelve hours, after which liquid diet is ordered.

The nurse must obtain written orders from the physician regarding all these details if she is not familiar with his practice. The instructions here given are to indicate the general course of treatment and for the general information of the nurse.

The bowels should move on the third or fourth day, but if the patient passes flatus no trouble need be anticipated in this direction. The physician usually orders a cathartic,



Fig. 134.—Binder pinned on one side. The nurse will not hurt the patient when taking out or putting in safety pins.

to be followed by a colonic flushing, the composition of which the nurse should ascertain from him. Some physicians avoid cathartics. Milk and molasses, āā 3vj, make a most efficient enema, to relieve flatulence and provoke movement of the bowels. For gas-pains the rectal tube or the glass dumbbell (Fig. 193, p. 409) may be tried.

Extreme tympany, persistent nausea and vomiting, obstinate constipation, severe pain, hiccup, fever occurring at any time after the operation, are to be noted on the

history sheet, and the doctor's attention drawn to them. Sometimes they indicate a beginning peritonitis.

The child does not require any other care than that given after normal labor. It is put to the breast twelve hours after the operation if everything goes well, and regularly, as per schedule given on p. 203.

Convalescence.—The sutures are usually removed on the ninth or tenth day. The physician may apply adhesive

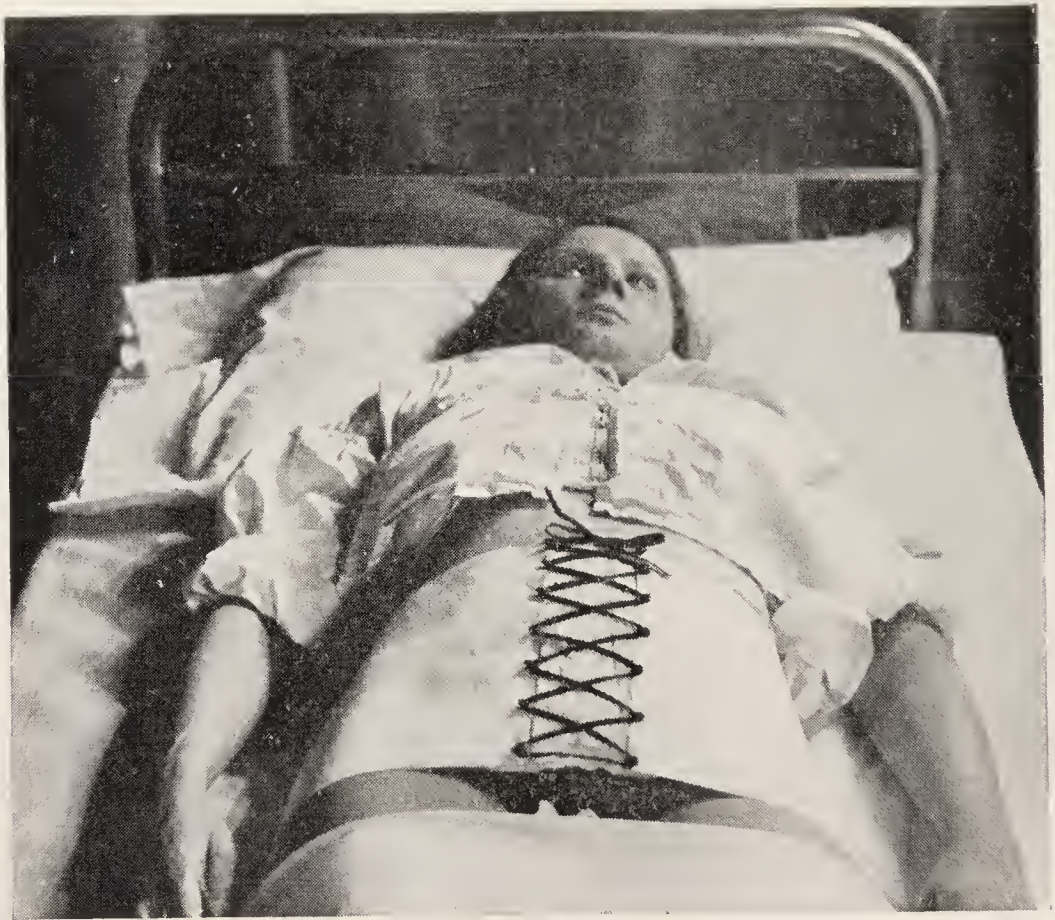


Fig. 135.—Adhesive corset. Laced. This is worn for 2 or 3 weeks.

strips or a firm binder to support the wound (Fig. 135). Bed exercises are begun the third day and the patient sits up at the end of one or three weeks, depending on the practice of the operator.

The dictum "once a cesarean always cesarean," has only qualified application. The fear is that the uterine scar may rupture during subsequent pregnancy or labor. Most women after one cesarean, especially if it was the cervical

kind, can go through pregnancy and labor safely again,—though they are likely to have few babies after it. However they require careful watching during the latter part of pregnancy and particularly during labor. The last weeks of pregnancy should be spent in a hospital and during labor,

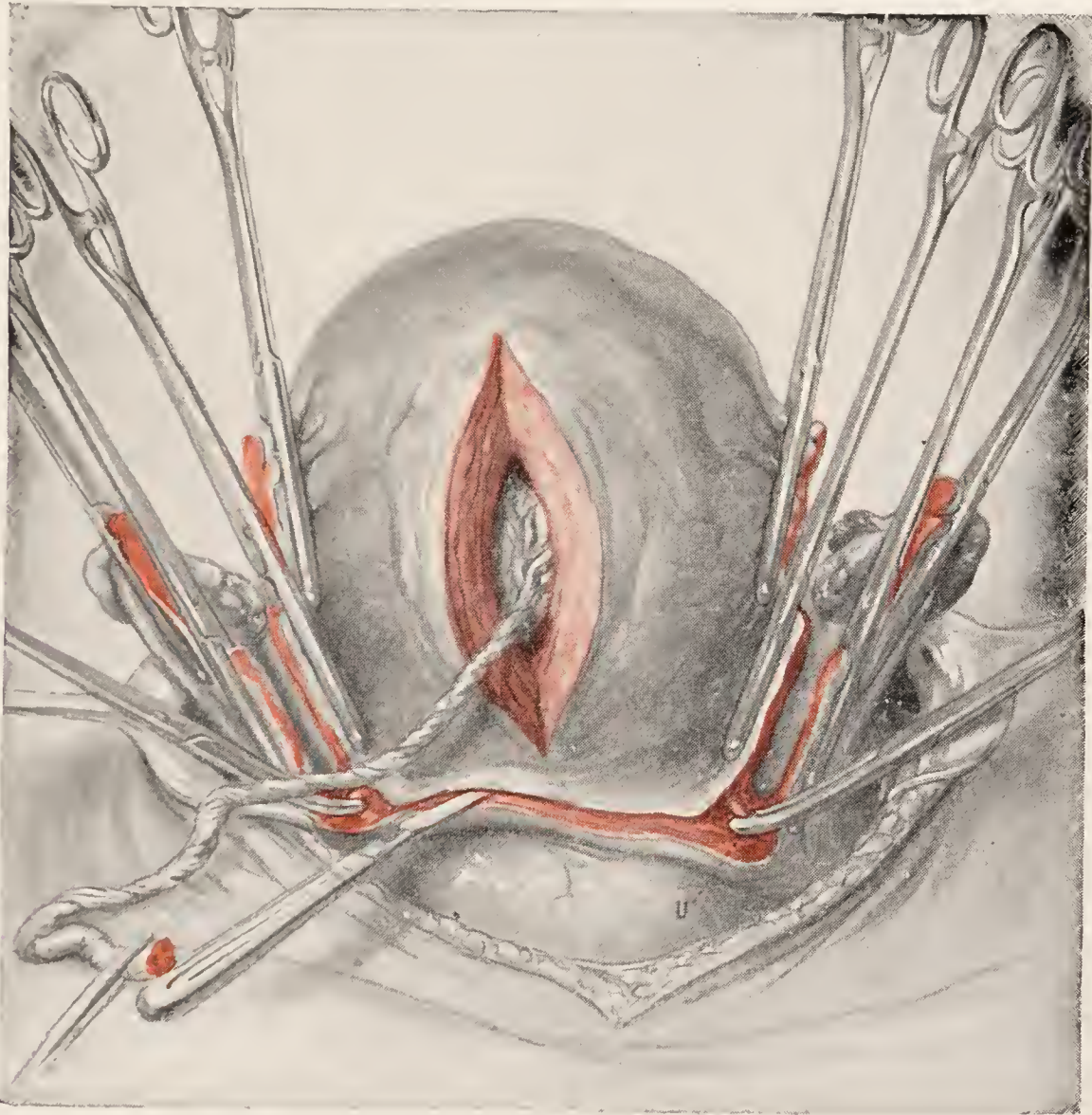


Fig. 136.—One step of Porro operation. The broad ligaments are clamped and cut—the amputation of the uterus begun.

the operating room is to be set up as for laparotomy so as to be instantly available should the uterus rupture.

Vaginal Cesarean Section.—This is one method of rapid delivery from below. The anterior wall of the vagina is incised and the bladder pushed forward, away from the uterus, and then the anterior wall of the uterus is divided with scissors, making an opening large enough for the

extraction of the child. The perineum is also incised if necessary. After delivery is completed all the structures are reunited by suture.

The preparations by the nurse are the same as for forceps operation plus those for vaginal extirpation of the uterus (hysterectomy).

Symphysiotomy.—This is the section of the pubic joint which allows the innominate bones to separate, and thus the cavity of the pelvis is enlarged, sometimes permanently. The operation was invented by Sigault, a medical student, in 1773, but was discarded because of its dreadful mortality. Sigault's case, the wife of a gendarme, dragged out a miserable existence after its performance on her, but Sigault was given a medal for devising it. About 1892 there was a revival of the operation, because the blessings of asepsis rendered it quite safe.

Pubiotomy or **hebesteotomy** resembles symphysiotomy with the exception that not the joint, but the bone near the joint is opened. A wire saw invented by Gigli (pronounced Zhee'lee) is used, and the section is often done subcutaneously. Both symphysiotomy and pubiotomy are intended to enlarge a contracted pelvis and thus permit delivery through the natural passages, but they have fallen off in favor, since cesarean section, especially the newer types (the low cervical), have been found to be safer and more satisfactory. The immediate recovery after pelvic splitting operations is more stormy and the patient may walk with difficulty for years. Further 10 per cent of the babies are lost.

There are three stages in the procedure: (1) The sawing open of the pelvis; (2) the delivery of the child; (3) the repair of lacerations.

The Operation.—The patient is prepared as for any major obstetric operation, and lies on the table with the limbs partly extended. The Gigli or wire saw is carried around the back of the pubic bone through either a small incision or a puncture. The introduction is effected

by means of a large needle or a special carrier (Fig. 137). After the bone is severed the child is delivered by forceps or version, or the case left to nature. The ends of the bone separate 1 or 2 inches during the delivery and the sides of the pelvis are supported by the assistants.

The hemorrhage and lacerations, if present, are attended to, the bladder catheterized to see if it is injured, and the patient carefully carried to bed. Four assistants are needed besides the nurse.

LIST OF INSTRUMENTS

Two trays, to be kept separate.

First Tray:

One scalpel.

Two Gigli wire saws (Fig. 137).

One special carrier or large needle (Fig. 137).

Scissors.

One broad grooved director.

Four artery clamps.

Four 8-inch pedicle clamps.

Needle-holder.

Four full-curved, spear-pointed needles, $1\frac{1}{2}$ inches.

Two retractors.

Uterine sound or metal catheter.

Second Tray:

Forceps, axis-traction forceps, and all instruments given under Forceps Operation. (See p. 279.)

The operator is careful not to mix the instruments of the two trays. The first tray is used for the opening of the pelvis and closing the wounds afterward. The second tray is used for the second stage of the operation—the delivery part. The vagina is considered septic, and this is the reason for the two separate trays of instruments.

After delivering the child the operator resterilizes his hands, or draws on new sterile gloves before going again to the pubic wound. This is one of the main dangers of the operation, that the pubic wound will become infected from the vagina, and the nurse has to do her share to prevent it in the puerperium.

After-care of Symphysiotomy and Pubiotomy.—It is highly important that the patient be given intelligent nursing, as she is practically paraplegic after such operations. For the first few days she does not have the use of her limbs—she cannot raise the hips and should not try to do so. The integrity of the pelvic girdle is temporarily destroyed.



Fig. 137.—Gigli (pronounced Zhee'lee) wire saw and pubiotomy needle.

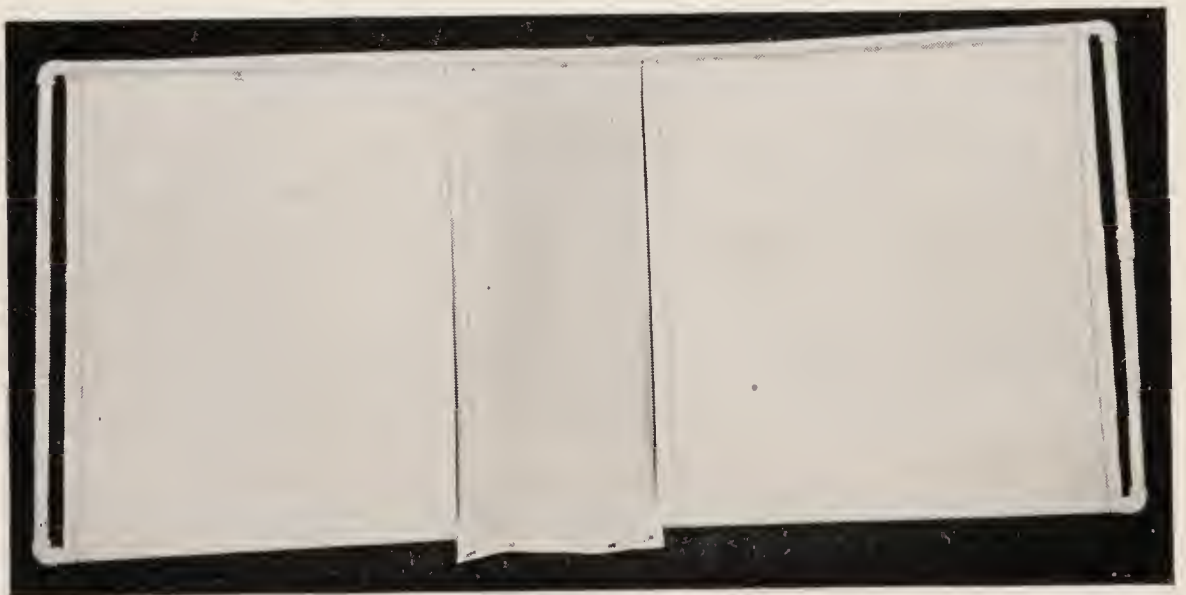


Fig. 138.—The symphysiotomy bed-frame.

The patient, after the operation, is dressed with adhesive strips about the pelvis to support the bones in apposition, or this is done by a tight binder strapped on. She is placed on a special symphysiotomy bed, if one is obtainable, though this is not absolutely necessary; any nurse can improvise such an apparatus, the idea being to have the bed

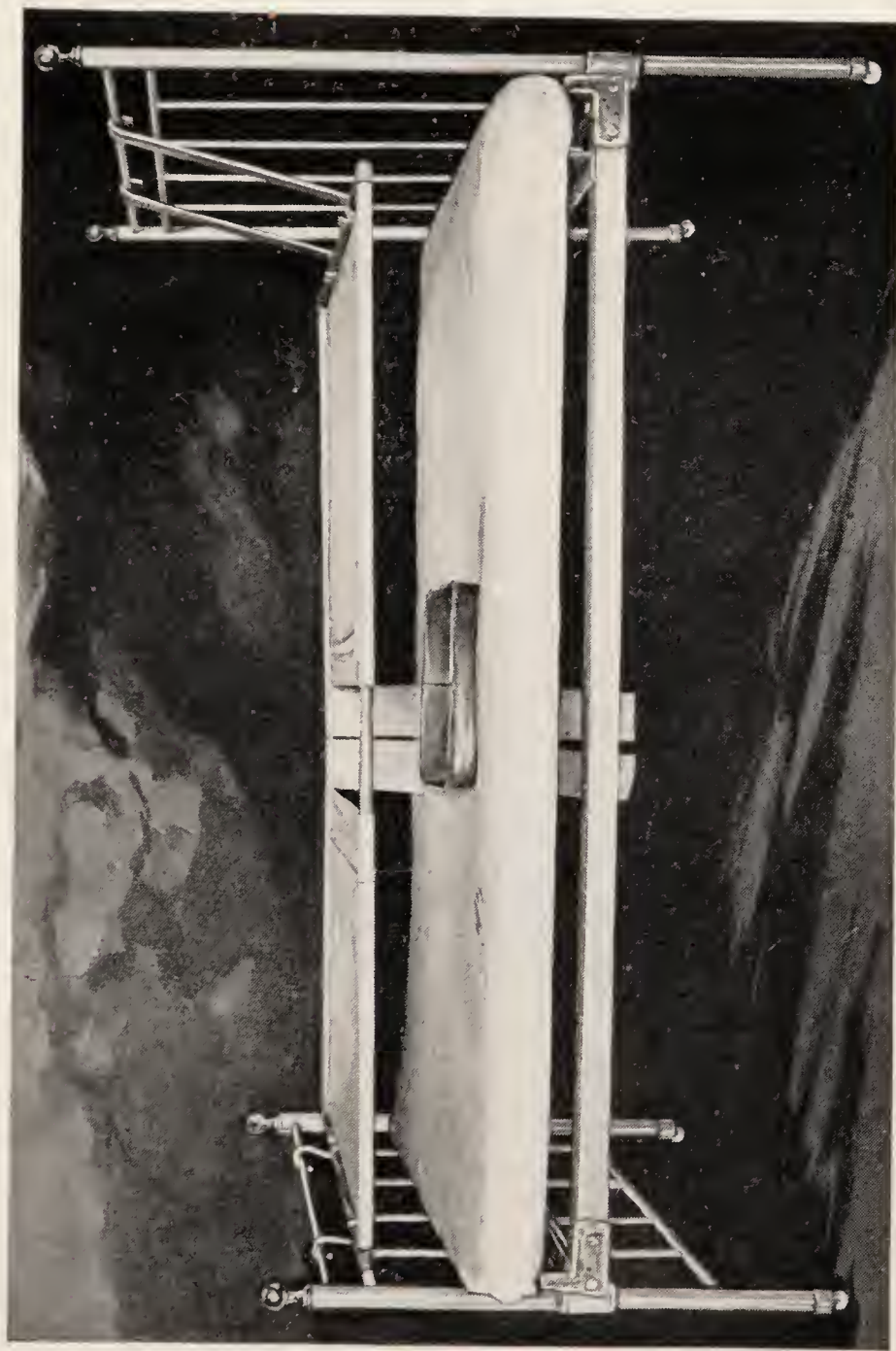


Fig. 139.—The symphysiotomy bed, with frame elevated. This bed may be used for other kinds of patients, *e. g.*, phlegmasia alba dolens, paralyzed women, fractured pelvis, etc. A plumber can make the frame,

arranged so that the patient may be raised up for the use of the bed-pan and for dressings. The plumber may make a frame of $\frac{1}{2}$ -inch iron gas-pipe, 32 by 66 inches, or long enough to fit inside the bed. The nurse then covers this frame with strong muslin, as shown in Fig. 138. At the middle, where the buttocks will lie, the strips of muslin are to

be pinned at the side with strong safety-pins. When the patient is raised off the bed these strips are unpinned and access to the genitals is thus obtained.

This frame may be raised by means of four ropes attached to the corners and running through pulleys in the ceiling, or it may be lifted on to four hooks hanging on the head and foot of the bed, as shown in Fig. 139.

The bed is dressed as usual, the frame is laid on it, and the patient lies on the muslin strips. When necessary to make a dressing or give the patient the usual attentions, the frame is raised about 12 inches. The strips beneath the vulva are loosened and drawn aside. This arrangement simplifies extraordinarily the after-care of these cases, which at best is trying and tedious. The nurse should watch for a hematoma, a blood-clot around the pubic joint, which is not infrequent after hebosteotomy, and for signs of injury to the bladder. If a retention catheter has been inserted the nurse must be sure that it is draining without interruption. (See Fig. 195.)

Particular care is necessary to prevent the lochia from gaining access to the wound in the mons pubis. To avoid this the nurse adjusts the vulvar pad firmly above, loosely below, so that the lochia will have free flow downward, and arranges the wound dressing so as to keep the wound covered.

Catheterization is particularly difficult because the patient is not allowed to separate the limbs more than a few inches. By turning the patient's toes inward the nurse may part the knees without causing much pain.

After two weeks the frame may usually be dispensed with. Several weeks may pass before the patient is able to resume her household duties. Some operators dispense with the frame.

MINOR OPERATIONS

Minor operations are as important as any, and should be prepared for with the usual aseptic care.

Preparation for Obstetric Examination.—The nurse is expected to arrange a patient for the digital obstetric or gynecologic examination quickly and neatly. A pair of sterile gloves, a basin of 1 per cent lysol solution, a supply of pledgets, some lubricant, and a sheet are necessary. If the physician desires the patient across the bed she is placed as in Fig. 141. The sheet is laid on the bias over the trunk, the opposite corners are wrapped around the legs,

while the two remaining corners are draped one over the body, and the other to form a flap which hangs between the thighs till the examination is about to be made. The nurse will sponge the parts carefully herself before the physician inspects them, and will report to him the presence of bloody, purulent, or odorous discharge. The patient's limbs, as shown in Fig. 141, are supported by the nurse. They may be allowed to rest on two chairs or on the knees of the physician.



Fig. 140.—Patient obliquely in bed, draped with a sheet, prepared for internal examination. One limb rests on a chair, the other on the edge of the bed. The buttocks are near the edge of the bed, which is protected by a newspaper covered with a towel.

Occasionally the nurse is requested to arrange the patient obliquely on the bed with one foot resting on a chair (Fig. 140).

Perineorrhaphy.—The most common of minor operations is perineorrhaphy, or the repair of lacerations of the pelvic floor.

For a perineorrhaphy after labor the patient is usually put across the bed in the lithotomy position (see Fig. 115). If

the laceration is more than small, it is wiser to use the table, as much better work can be done. The operation has already been described on p. 175.

The after-treatment of stitches when the laceration was extensive differs somewhat from the usual. (See p. 206, special perineorrhaphy orders.) Extra care must be taken not to pull on the knots when a dressing is made or a bed-pan is used; also that the suture ends do not catch in the dressing and drag on the wound. Should the patient complain of the ends of the sutures pricking her, the nurse may wrap them in sterile gauze or let them lie between two layers of lintine. At each dressing notice is taken of any signs of irritation, swelling, special tenderness, or pus formation, or of cutting around the stitches or line of union, and a note is made of same on the record sheet.

The parts around the wound should occasionally be washed with soap and water to remove dried secretions and macerated epithelium.

Removal of Sutures.—Catgut does not need to be removed; silk and silkworm-gut do. This is done on about the tenth day.

The nurse sterilizes two sharp-pointed scissors, one long, one short, artery forceps, one tissue forceps, and a short, narrow, highly polished speculum (Fig. 141). The physician requires excellent light. The provisions for asepsis are as usual (sterile gloves, etc.), and the arrangement of the patient, tables, and basins is similar to that used when the perineorrhaphy was done. As there is often a shortage of assistants, the nurse should arrange everything in readiness for the physician to wait on himself. Then she holds the legs as in Fig. 141, with the buttocks toward the window light.

The sheet-sling may be used or each foot placed on a chair. The patient should rest quietly for several hours after the sutures are removed.

Uterine Tamponade.—The tamponade or packing of the uterus with gauze is done to control postpartum hemor-

rhage, and also by some accoucheurs in the treatment of puerperal sepsis. The physician needs specula, vulsellum



Fig. 141.—Patient across the bed, draped with a sheet, for removal of sutures. The instruments lie in the basin in which they were boiled or upon a sterile towel: Speculum (if vaginal sutures), 2 artery forceps, 1 tissue forceps, 2 sharp-pointed scissors.

forceps, long uterine packing forceps (Fig. 142), and a jar of sterilized or antiseptic gauze. This gauze should be $\frac{1}{2}$



Fig. 142.—Author's long uterine packing forceps.

yard wide and 12 yards long, and packed in jars from below upward, so that when needed it may be served right out of the jar (Fig. 260). If the available gauze is rolled, the roll

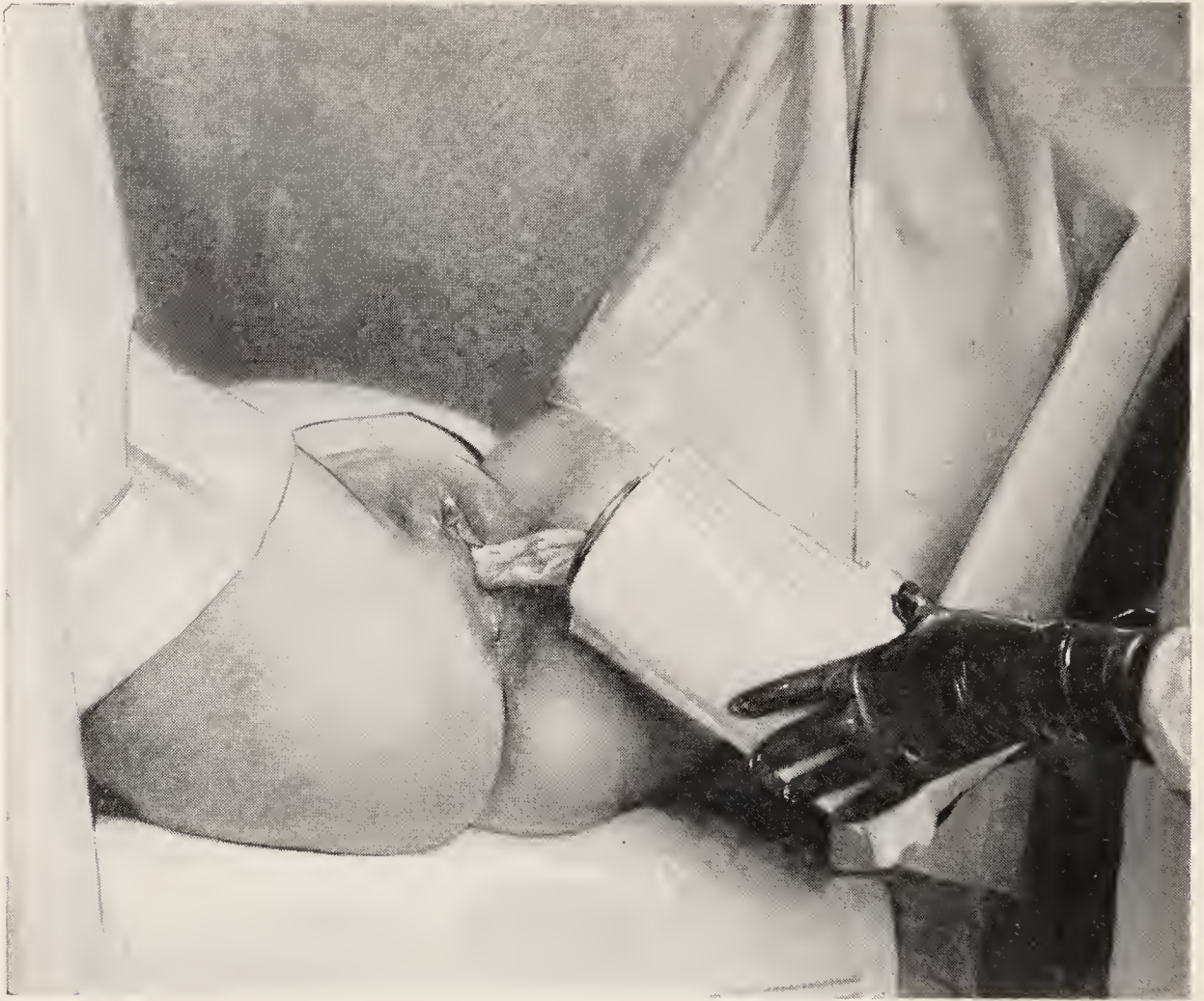


Fig. 143.—Nurse holding gauze ready for uterine packing. Edge of jar is 3 inches from vulva and jar is held steady.



Fig. 144.—Showing how nurse unrolls gauze by means of two forceps as the doctor packs it into the uterus. Rubber gloves, etc., are, of course, used in actual practice. Gauze that comes in jars is better.

may be served out of a sterile basin, or from two forceps attached to the center, as in Fig. 144.

The patient is arranged across the bed or on a table in the lithotomy position. For this operation the limbs may be supported on chairs. The nurse wraps the jar in a sterile towel and holds it against the buttock, about 3 inches below and to the side of the vulva (Fig. 143). The physician picks up the end of the gauze with long forceps and carries it into the uterus, which he has drawn down with vulsella, or steadies with two fingers of the other hand.

After the uterus is packed a pad and then the binder are applied. Special care must be taken in moving patients that are tamponed, as the uterus may stretch dangerously tight over the packing or even rupture if the patient is tossed about.

The Douche.—The practice of vaginal and uterine douching after labor has undergone nearly a complete reversal in the last fifteen years. Whereas formerly it was thought that douching aided recovery and prevented puerperal infection, accumulated experience has proved that the irrigations in normal cases are superfluous if not actually harmful. In puerperal infection medical opinions differ as to their value.

The vaginal douche is a much simpler procedure than the uterine douche, and the latter the nurse ought not be called upon to give, although with a little special instruction she can learn to practice it. The dignity nowadays accorded the uterine douche places the responsibility on the physician.

The Vaginal Douche.—The arrangement for giving the douche is pictured in Fig. 191. The aseptic preparations are as usual. For vaginal douching the patient lies on her back in bed on a douche-pan, which should be sterile. The douche-bag and nozzle should be freshly sterilized, and sterilized water, saline solution, lysol used, according to special order. For the vaginal douche the point is inserted

2½ inches downward and backward, avoiding the perineum. The bag should be no more than 2 feet above the patient, and the return flow from the vagina must be free, which is accomplished by pressing the tube slightly against the side of the vulva. The nurse must have sterile hands or wear rubber gloves. One quart is usually sufficient. The patient is asked to bear down a little to express any liquid remaining in the vagina, the parts are gently dried, and the douche-pan is removed. The nurse observes and notes any clots or shreds that have come away, and also the odor of the discharge. If bichlorid or carbolic acid is ordered as a douche, care should be taken that the proportion is right and the mixture perfect, and it should be followed by sterile water. Cases of fatal poisoning are recorded due to neglect of these precautions, which are as necessary in private homes as in hospitals.

The Uterine Douche.—For this the patient is usually placed across the bed or on a table, as often it is combined with a digital palpation of the interior of the womb. A broad speculum, two vulsellum forceps, a long uterine applicator, and a uterine douche point should be boiled. Sterile tubes for cultures should be provided.

Plenty of sterile water is needed, as these douches are often copious. The patient is placed on a Kelly pad or on a rubber sheet draped over a roll of newspapers. The floor is properly protected and a drainage pail provided.

The patient must be kept quiet after this operation. Not seldom it is followed by a chill and rise of temperature.

Uterine Curetage.—This operation is done in the treatment of abortion and in puerperal infection, and its object is to remove pieces of decidua or placenta that are retained and decomposing in the uterus. Physicians differ as to the advisability of the practice, the majority believing that it breaks up nature's protective wall of granulations and actually facilitates the invasion of the deeper structures by virulent germs. (See p. 391.)

The preparations are the same as for a major operation—table, anesthetic, hot and cold sterile water, sterile gloves, etc. The instruments required are specula, curets, as the physician selects, uterine packing forceps, cervix forceps, vulsella, uterine douche tube, scissors, sterile glass for specimen, test-tubes for cultures. A basin of sterile water in which the operator may rinse the curet of adherent particles of tissue should be placed at his side. Gauze—iodoform, lysol, or plain sterilized—for packing the uterus may be needed.

Since these operations are done for septic cases the nurse should be careful of her hands, not to prick her fingers on the instruments, and not to carry infection to the mother's breasts or the child's eyes or navel.

The Administration of Saline Solution.—One of the most precious additions to our means for saving life is the use of saline solution transfusion. In the olden time blood from another person was transfused in cases of severe hemorrhage, and many cases are on record of such heroic sacrifice, but only recently has the direct transfusion of human blood been practicable and safe. In 1881 Schwartz showed that salt solution could be used for temporarily replacing loss of blood in animals, and von Ott and Bischoff were the first to employ the measure in the treatment of anemic patients.

There is but little doubt in the minds of general and obstetric surgeons that the use of salt solution for their various purposes saves lives. It may tide the patient over a critical period. Then pure blood from a healthy donor may be given if needed. We give salt solution for conditions other than hemorrhage, such as wasting diseases, hyperemesis gravidarum, eclampsia, peritonitis, and also to newborn babies when they have the so-called "starvation fever."

An expensive apparatus, though more convenient, is not necessary except in hospitals, where the operation is frequently done.

The saline solution may be injected under the skin (hypodermoclysis) or by intravenous administration.

LIST OF INSTRUMENTS FOR HYPODERMOCLYSIS

One 2-quart douche-bag or can with tube 6 feet long.

One 1-quart measure.

One bath-thermometer registering over 212 F. This is removed from its wooden case.

Two salt solution needles (Fig. 145).

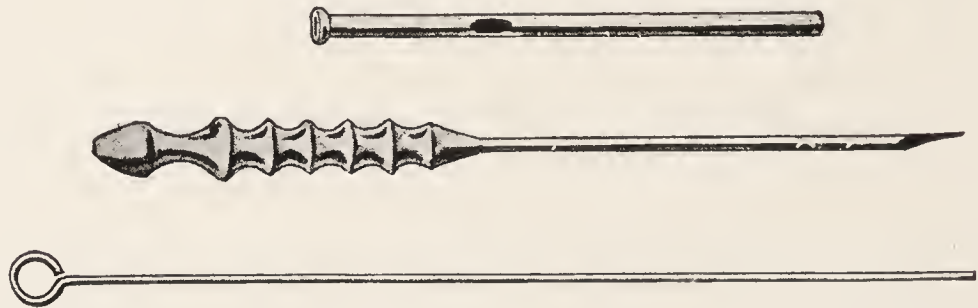


Fig. 145.—Author's needle used for hypodermoclysis, with stem and protecting cover. There are two sizes.

For intravenous transfusion add:

One small sharp scalpel.

Two small curved needles.

One sharp-pointed scissors.

Two fine rat-toothed dissecting forceps.

Three artery forceps.

Two salvarsan needles or special trocars.

Several strands of sterile silk.

One tourniquet for the arm. Do not forget to remove it before the fluid is injected.

For intravenous injections a rubber douche-bag may not be used, and the tube must be boiled in sodium hydrate solution. The rubber sometimes contains chemicals which act unfavorably on the blood.

Distilled water also is necessary for intravenous injections, to avoid chills and fever; it is not essential for subcutaneous administration.

In a private house the nurse will proceed as follows:

The 2-quart douche-bag or can and tube, the 1-quart measure, and the bath-thermometer are put on to boil in

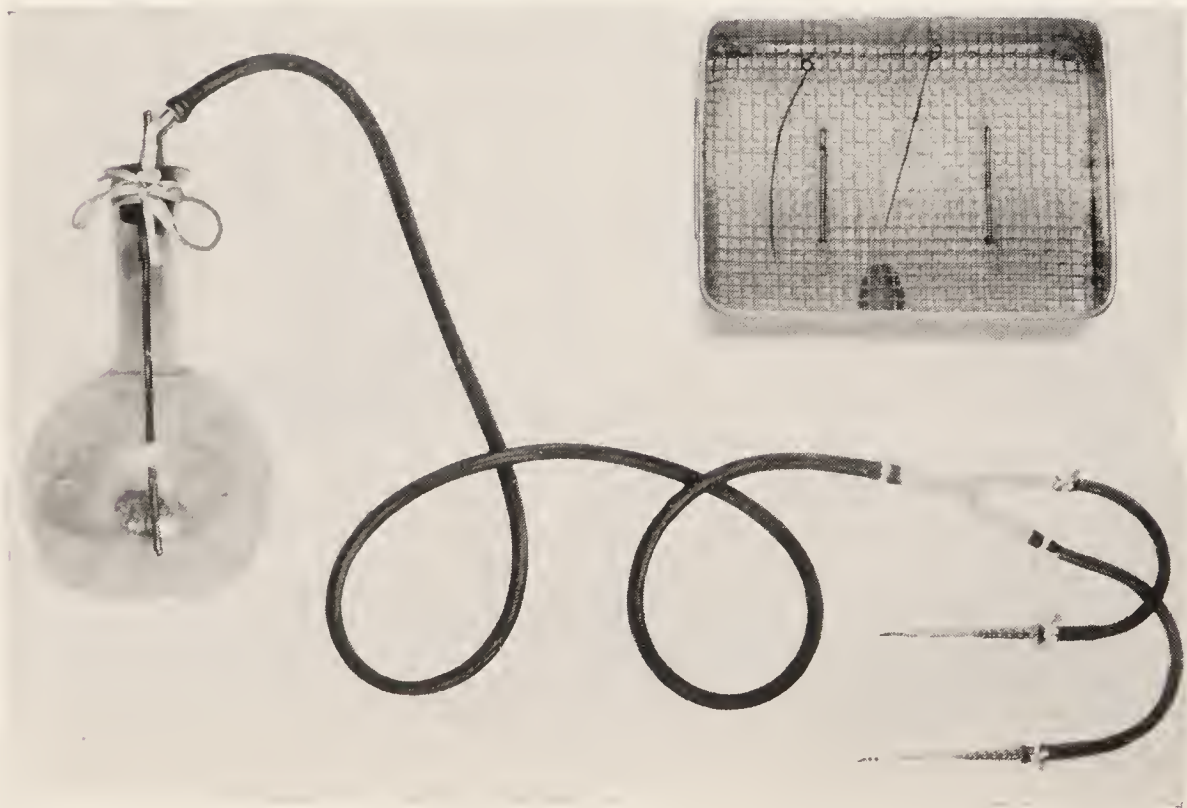
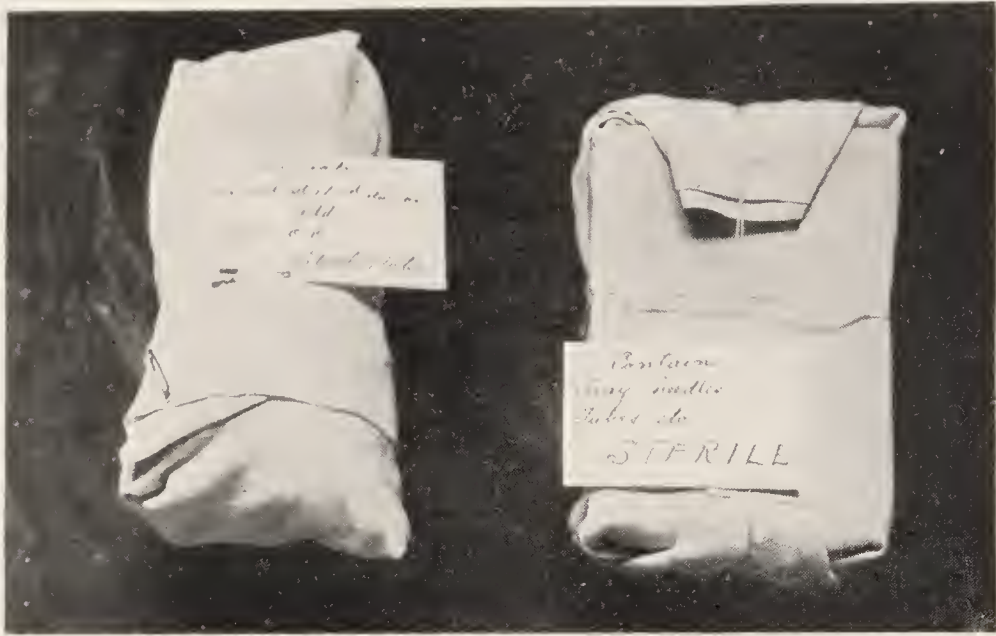


Fig. 146.—Salt solution apparatus of Chicago Lying-in Hospital. Above, wrapped, all sterile. Below, assembled, ready for use. The sterile salt is already inside the Florence flask. The basket and tubes and needles are reboiled for five minutes just before using.

1 per cent soda solution. The rubber goods must be wrapped in several layers of towel. They are boiled vigor-

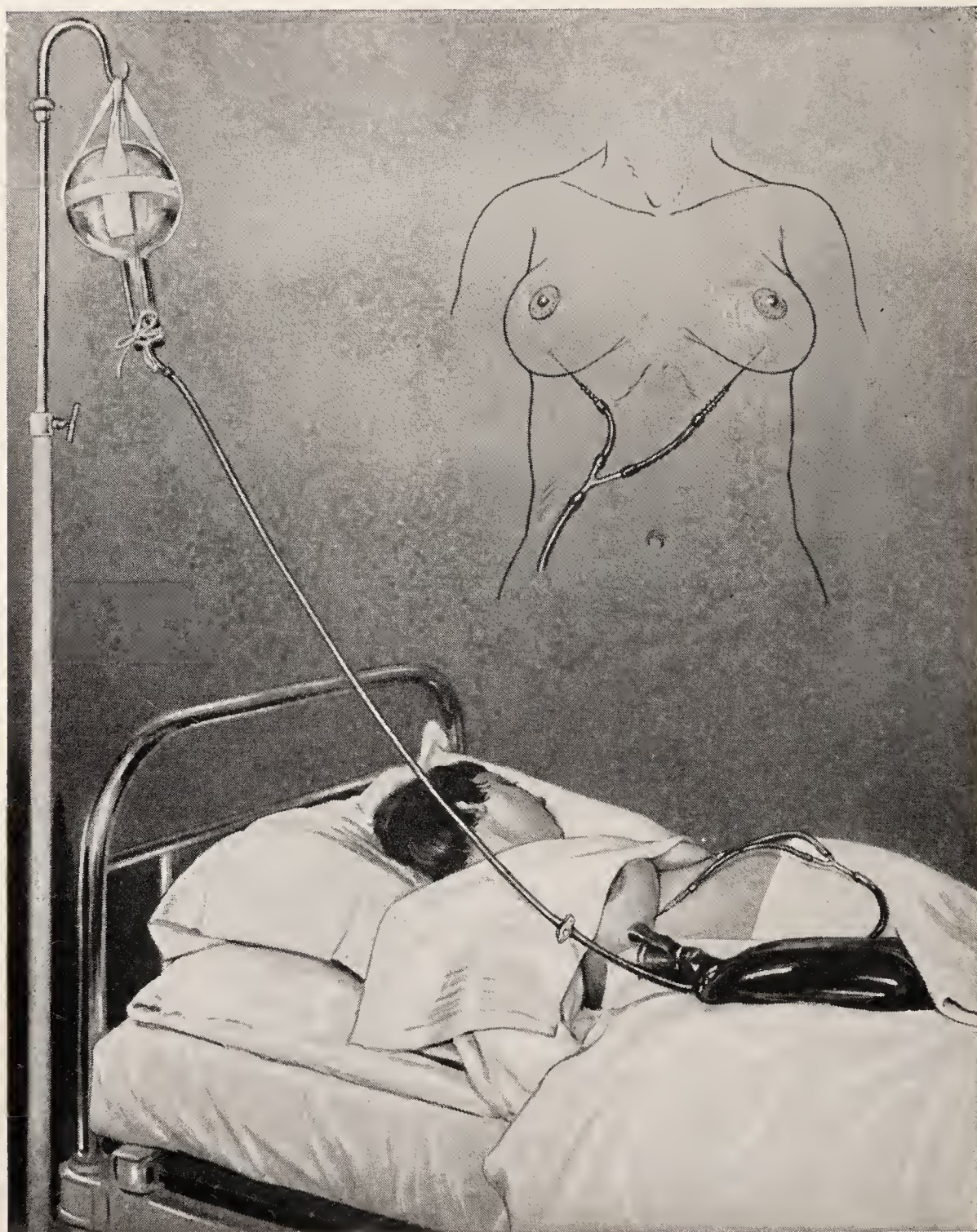


Fig. 147.—Subcutaneous administration of saline solution. Compare with Fig. 146. A hot-water bag warms the solution in the tube, both supported by a pillow. It is of further advantage to lay a warm water bag on the skin near the needle. It warms the tissues, facilitates the absorption of the fluid, and relieves the pain. Not too hot!! Five per cent glucose solution may be given in a similar manner.

ously, tightly covered, for fifteen minutes, and are rinsed, inside and out, with hot sterile water. The instruments and thermometer are sterilized separately and are served out of the pan in which they were boiled.

Salt solution, 0.7 per cent, is that most generally employed, though sometimes other chemicals are added. It is made by dissolving 2 drams of common table salt in 1 quart of water. In practice 2 teaspoonfuls to 1 quart will give accurate enough dosage. Unless the salt has been previously sterilized, the solution when made up must be boiled vigorously for fifteen minutes in a tightly covered vessel. It is poured, hot, into the douche-bag, the mouth of same stoppered with a large pledget of sterile cotton, and the side of the bag held under the cold-water tap. The thermometer is inserted alongside the cotton. In this way the solution is quickly brought to the right temperature—110 to 115 F.—as ordered. By the time the fluid reaches the patient passage through the long tube will have cooled it off several degrees.

The skin is prepared by scrubbing with water and soap, with lysol and alcohol, or by painting heavily with tincture of iodine and the field surrounded with sterile towels.

For subcutaneous transfusion (Fig. 147) the area *under* the breasts is often selected, care being taken not to insert the needle into the gland tissue or between the ribs; for intravenous (Fig. 148), the large vein in the bend of the elbow. With the subcutaneous method the bag is raised 5 feet above the patient to obtain sufficient pressure; for the intravenous method a height of 18 inches gives sufficient force. A shorter tube is used. The puncture under the breast may be sealed with collodion, with adhesive plaster, or closed with a Michel clip. In the absence of either, the solution may be prevented from escaping from the needle puncture by holding a pledget soaked in alcohol over it for a few minutes. The wound in the bend of the elbow is dressed aseptically under firm compression.

Preparations for Blood Transfusion.—When a woman has lost so much blood that the attendant believes salt solution will not save her, he replaces the lost red blood-corpuscles by blood from another human being, usually the husband if his blood is compatible. There are two methods of blood transference—the direct, vessel-to-vessel, and the indirect, when the blood is first drawn into a container and



Fig. 148.—Giving glucose, or salt solution, intravenously. By raising or lowering the burets and by keeping the level of the solution at a certain height one can obtain a regular flow of 8 to 10 cc. per minute. The needle is No. 19 gage.

then injected into the recipient. Sometimes the blood is mixed with sodium citrate solution to prevent its clotting. There are many variations in each method, too many to permit their exposition here.

If blood is not immediately available in cases of shock and hemorrhage we inject 6 per cent gum-acacia-glucose into the vein to tide the patient over until a donor can be got or the woman rallies.

In cases of placenta praevia or where hemorrhage is expected we have at hand a blood donor whose blood has been "typed" and "matched" satisfactorily with the patient. In emergency, if the doctor or nurse is of group IV (universal donor) he or she may be able to save the woman's life. The



Fig. 150.—Arrangement for venesection with vacuum flask and trocar. Constrictor is removed while blood flows. A side table carries blood-vessel surgery instruments to be used if trocar fails.

blood may be injected with a syringe or, if citrated, with an ordinary douche bag.

Transfusion is more often employed to save newborn babies from the effect of hemorrhage from the bowels (melena) and other points (hemorrhagic diathesis). We used to unite the donor's artery to the jugular vein of the baby but now we have a simpler way which is to draw the blood into a syringe and inject it into the baby's longitudinal sinus in the large fontanel.

Venesection.—This means the withdrawal of blood from the vein, usually the median basilic at the bend of the

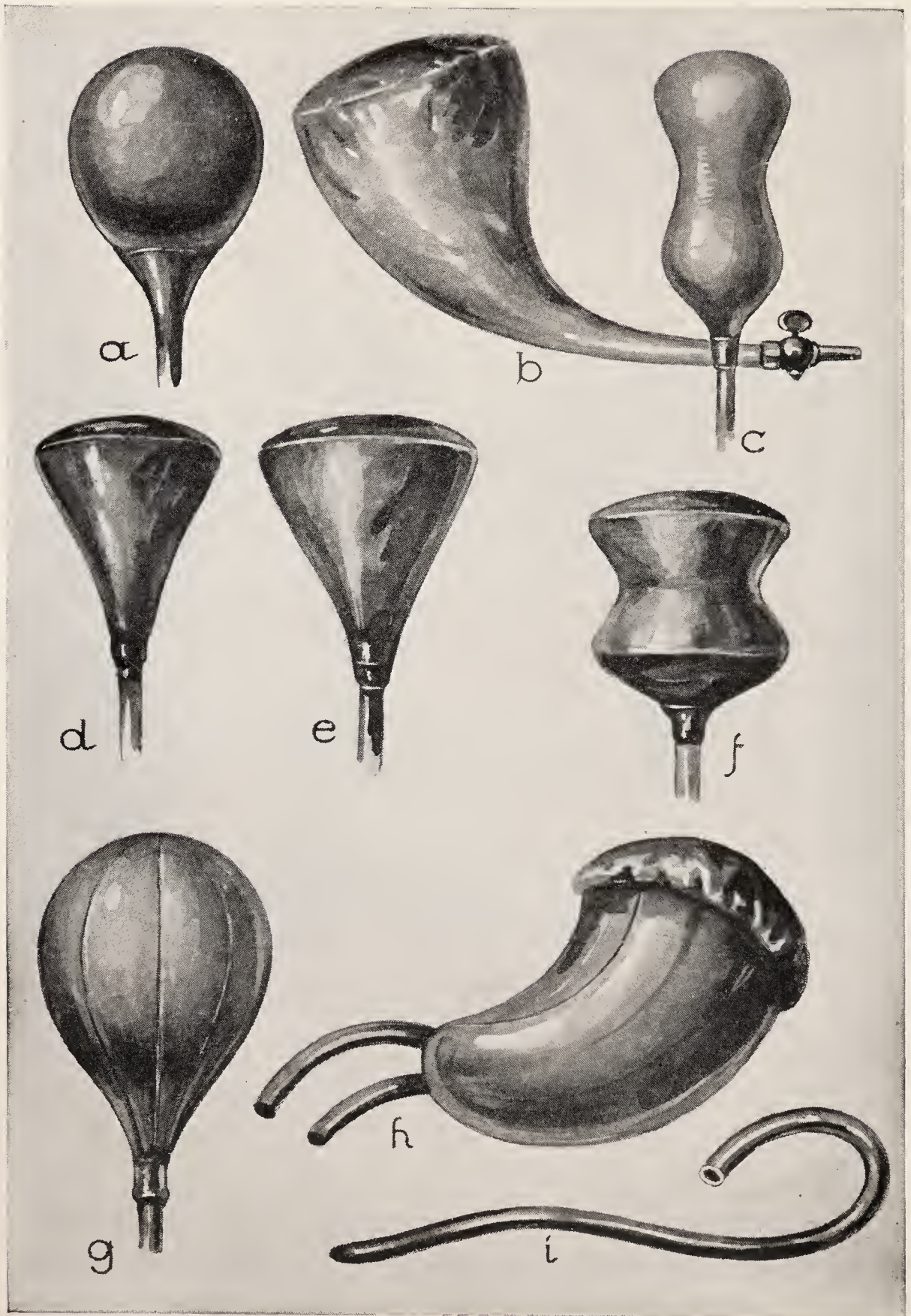


Fig. 151.—Various kinds of balloon dilators. *a*, Carl Braun's colpeurynter; *b*, Champetier de Ribes' inelastic bag; *c*, Barnes', soft rubber; *d*, *e*, Voorhees' or Dührssen's; *f*, Hirst's; *g*, air pessary; *h*, Pomeroy's; *i*, Bougie, (end is closed).

elbow. It is popularly termed "bleeding," and is often done in eclampsia, the object being to reduce the blood-pressure, and to remove some of the poisons circulating in the blood. The nurse will need to provide: A large transfusion needle with 4 inches of tubing attached; a sterile 500 cc. graduate or flask; sterile towels, material for dressing, and a rubber tourniquet. Often the cuff of the blood-pressure apparatus is used to compress the veins of the arm, and then the blood-pressure may be taken at the same time. Since the blood often clots and occludes the needle, it may be necessary to incise the vein, therefore a small sharp scalpel, scissors, tissue forceps, artery forceps, fine needles, and silk for suture should be prepared; also a large basin to be held under the elbow for the blood. From 200 to 600 cc. may be withdrawn.

The Induction of Premature Labor.—This operation is quite often done, the reasons being: contracted pelvis in the mother (a small, premature child may pass); threatened convulsions (eclampsia); placenta praevia, unduly prolonged pregnancy with overgrowth of the child, heart disease, pulmonary tuberculosis, pyelitis, nephritis, and many others.

There are several methods of inducing labor. One is to simply puncture the membranes. This is soon followed by labor-pains, but subjects the woman to dangers of "dry-labor." Another method is packing the cervix and lower uterus with gauze (Fig. 154). This is a slow method and may fail to start pains. The gauze is removed in twelve to eighteen hours. Krause's method of inserting bougies into the uterus is more rapid, but there is a little risk of separating the placenta from its bed.

The bag or balloon method is the favorite one. It is rapid and usually successful in starting pains, but it is not without danger of dislocating a lowly inserted placenta, of tearing the cervix, or of permitting the cord to prolapse. The bag is folded into a tight roll, painted with acriflavin

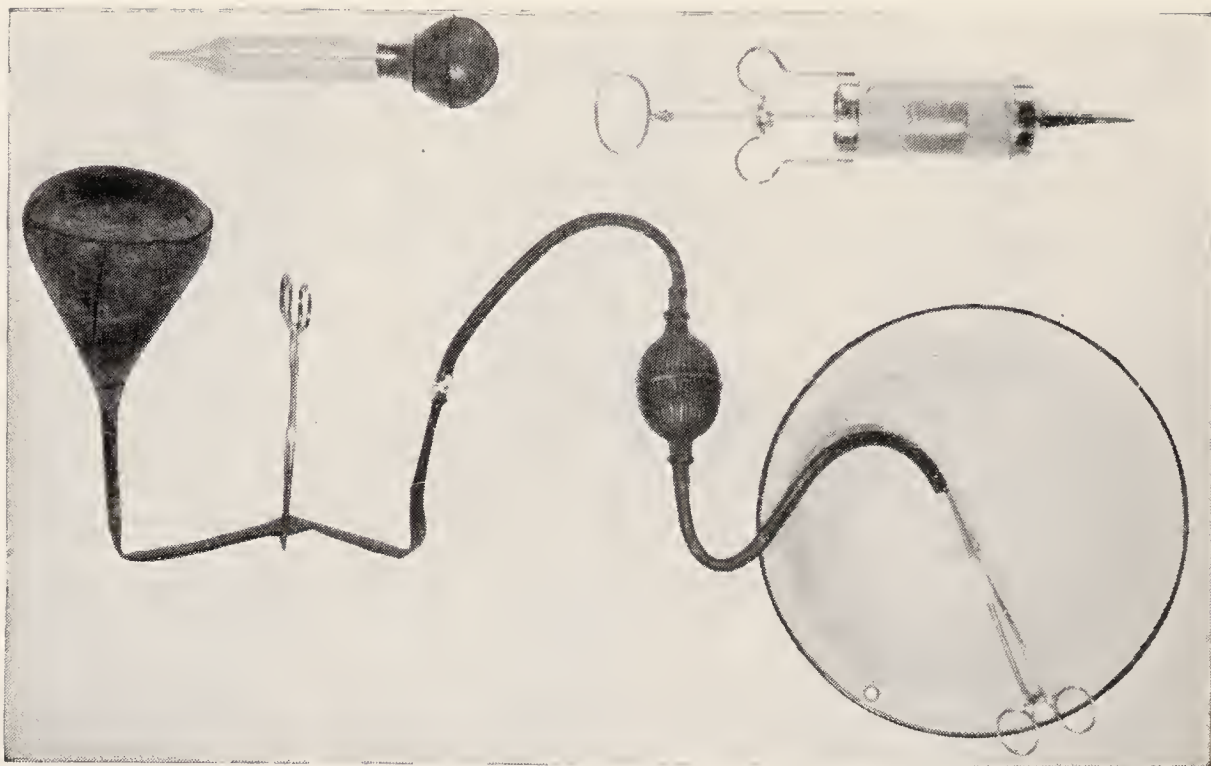


Fig. 152.—Three instruments for filling a colpeurynter. Top, Asepto syringe. Piston syringe. Below, Davidson bulb syringe.

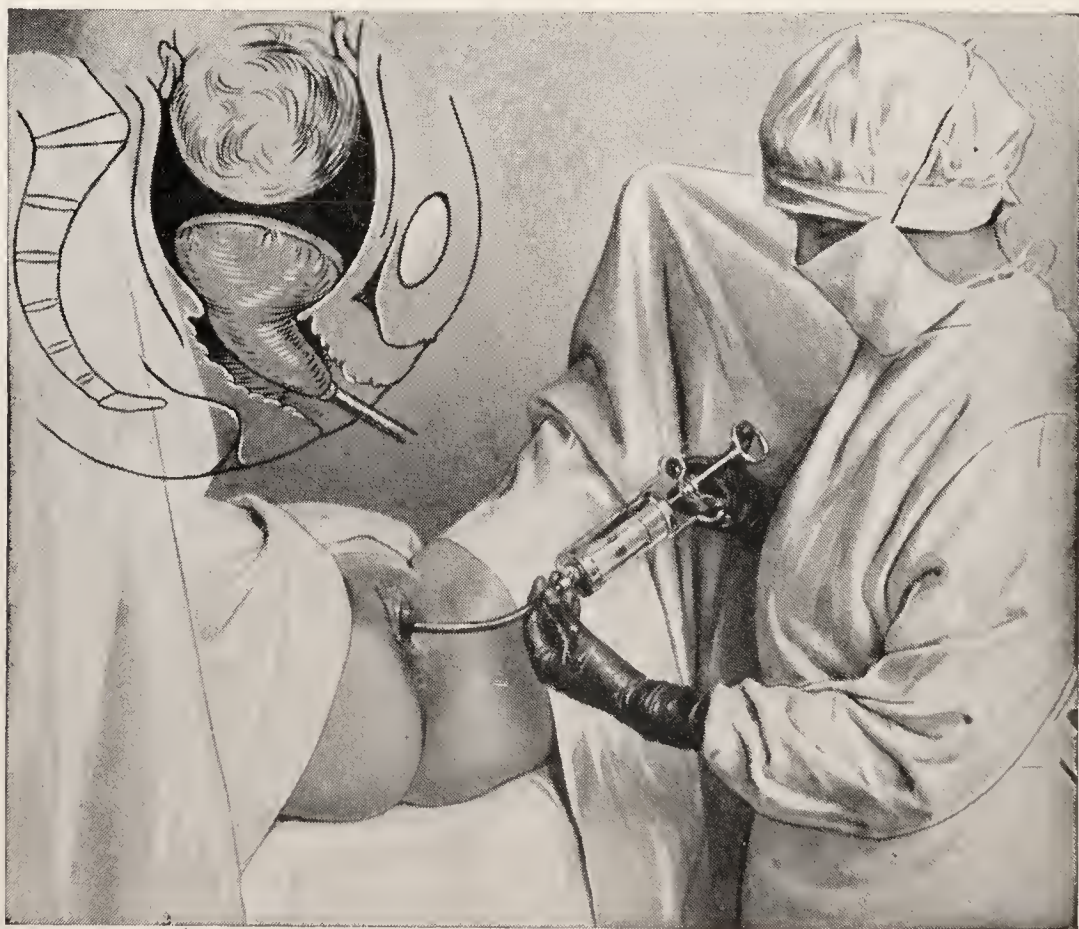


Fig. 153.—Filling colpeurynter with piston syringe. While the nurse refills the syringe the doctor holds the tube with an artery clamp.

compound, lubricated well, and gently insinuated through the narrow cervix. It is then filled with a weak lysol solution. With extreme asepsis the induction of labor has, of itself, no mortality, and the women do not sicken. If anti-septic precautions are neglected the operation is dangerous.

Preparations are the same as for any major obstetric operation.



Fig. 154.—Tubular gauze packer.

INSTRUMENTS NEEDED

For the rubber-bag method, balloon ordered by the operator (Figs. 151–153). (Always learn exact size desired.)

A long uterine dressing forceps.

Two specula.

Two vulsella.

Scissors.

A jar of sterile T. G. C. jelly or vaselin. (See p. 579.)

Two short artery forceps.

One bulb or piston syringe, *in working order* (Fig. 152).

One strand linen bobbin, 20 inches long.

For Krause's method, add two soft-rubber solid bougies (size 16, American).

For the gauze method, add a tubular packer (Fig. 154) and a supply of sterile gauze to fit the instrument.

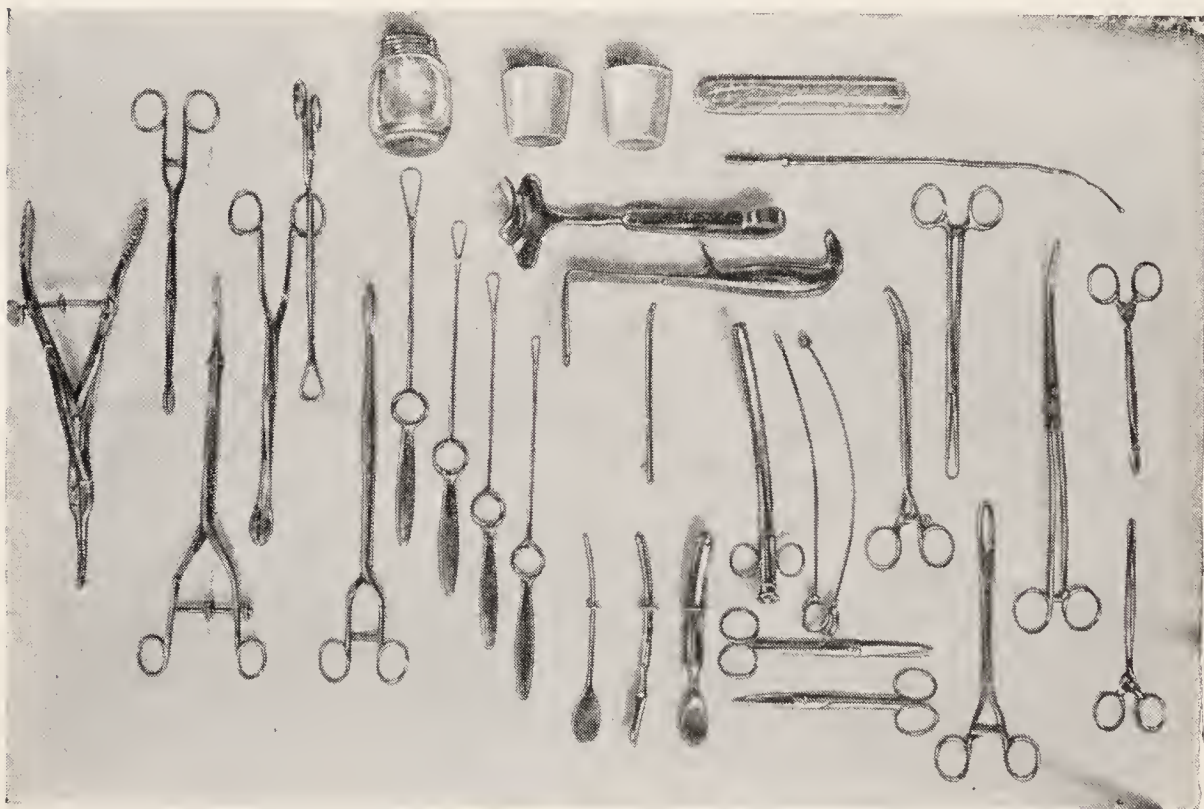


Fig. 155.—The instruments for the treatment of abortion and the operation of eurette: Lower row: uterine douche nozzle; 3 placenta forceps; uterine packing forceps; tubular uterine packer with pronged plunger; curets, four sizes; uterine dilators, two sizes. The upper row: 2 sounds; 1 artery clamp; 2 scissors; 2 retractors; 2 vulsellum forceps. Some operators prefer Hegar's graduated bougie dilators (Fig. 156). Note the three with guards to prevent them from slipping in too far and perforating the uterus.

The catheters and all soft-rubber goods are scrubbed with soap and water and then sterilized by boiling in pure water for thirty minutes in a tightly closed vessel. They must be wrapped in at least four layers of a thick towel to insure them against being burnt by lying against the hot metal. Hard-rubber syringes are sterilized by formalin or prolonged immersion in 1 : 500 bichlorid.

A vaginal douche is usually given, the vagina swabbed with acriflavin compound (acriflavin, 1 per cent; tincture of iodine, 2 per cent in glycerin) and the patient is placed across the bed or on a table, as for any obstetric operation.

The object of the operation is to induce labor-pains, to inaugurate labor, after which the case is left to nature or

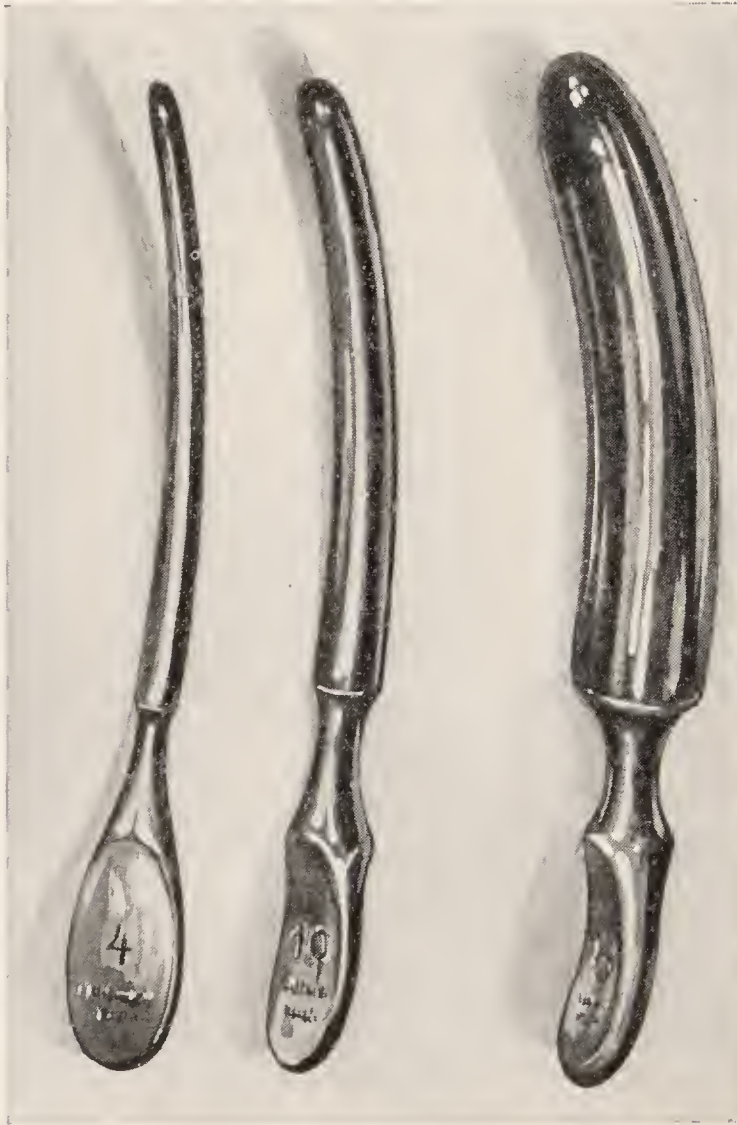


Fig. 156.—Three sizes of Hegar's dilators. There are twenty-four sizes.

treated as any labor coming on spontaneously at the same period of pregnancy.

The bougies lying in the uterus irritate it to contraction, as does also the rubber bag. The latter, in addition to being an irritant, mechanically dilates the cervix and often, to reinforce its action, a weight is attached to the tube and

hung over the foot of the bed (see Fig. 169). Pains come on in a few minutes or hours, or perhaps not for days, although it is not usual for the doctor to leave the instrument in the uterus for this length of time. The procedure is sometimes very tedious. If the labor is induced before term, the nurse should have the incubator ready. (See pp. 488-495.) She should enter the advent of labor-pains on the history sheet, and record the time of each pain until they are well established. If a bag has been inserted the nurse must observe if it leaks from the end of the tube—in which event she should retie it—or from the vagina, when she should notify the doctor, who will insert a perfect bag. The asepsis of the vulva requires especial attention while the bag is in place because bacteria can easily wander upward on the tube into the uterus. The exposed part of the tube should be painted with acriflavin compound every two hours and a sterile towel wrapped around it.

She should auscultate the fetal heart every twenty to thirty minutes because sometimes the bag compresses the cord and kills the infant, and the strength of the pains should also be watched because in rare instances they become so strong that they rupture the uterus.

Therapeutic Abortion.—This term is used to distinguish the operation of ending the pregnancy before the child is viable in order to save the mother's life, from the criminal operations performed by professional abortionists.

Perhaps the saddest commentary on our "modern civilization," on our "higher thought," on our "ethical movement" is the increase of the practice of criminal abortion. Nurses are not long in training before they see how alarmingly this crime has spread, and they see, too, the lives lost and the homes wrecked by it. A nurse should never be party to such a procedure. It is always murder, and in several states legally punishable as such, and often suicide, and by gentle counsel she should dissuade the woman from entertaining the thought of its commission.

Very rarely the conscientious physician is compelled to sacrifice a tender life in the mother's womb. Such occasions are: Uncontrollable vomiting, Bright's disease, some cases of tuberculosis, uncompensated heart disease, and a few others. As our medical knowledge increases the necessity for therapeutic abortion is growing less and less, and now it is only in rare cases that the accoucheur feels that the best interests of the mother, the family, and the community are served by this sacrifice. The operation, however, awakens sentiments of greatest delicacy; it involves heavy and painful responsibilities, and no physician will perform it without the counsel and moral support of at least one of his confrères. It is not sanctioned by the Catholic church, and in Catholic families the nurse should suggest that a priest be consulted.

The preparations are the same as for the induction of labor, the instruments are the same, with the addition of uterine dilators and curets (see Fig. 155).

One ounce of a 25 per cent solution tincture of iodine in sterile glycerin is prepared. The operator dips the uterine dilators in this before their introduction into the cervix. It is a lubricant and an antiseptic.

A basin with sterile water is to be provided in which the operator may float particles cureted out for inspection. The parts of the fetus removed piecemeal, arms, legs, etc., should be fitted together to make sure that the whole body has been extracted.

The after-care is identical with that of the normal puerperium.

Duehrssen's Incisions.—These are radiating cuts made in the cervix after it has been thinned out by labor. They open the cervix wide so that the delivery can be effected by forceps or extraction (Fig. 124, p. 278).

PART III

THE PATHOLOGY OF PREGNANCY, LABOR, AND THE PUERPERIUM

CHAPTER I

OBSTETRIC COMPLICATIONS

DISORDERS OF PREGNANCY

PREGNANCY tests the integrity of every organ in the woman's body. The heart, the lungs, the kidneys, the liver, the brain are under unusual stress. Almost always they have sufficient reserve to answer the normal demands of gestation, but if any one was impaired previously, it may break down under the added strain. Furthermore, a pregnant woman may have all the acute diseases a man may have. As a rule these run a severer and more critical course than in the non-pregnant state, because hemorrhagic tendencies are more likely to arise, and, in addition, there is the danger of abortion with the attendant shock and bleeding. Finally the gravid woman is threatened with disasters peculiar to the state itself, which means that the gestation may be prematurely terminated by abortion or premature labor; the location of the ovum may be faulty, *i. e.*, it may be in one tube (ectopic); or the placenta may be lying over the os uteri (placenta praevia); the placenta may be prematurely detached from its bed—"accidental hemorrhage" or *abruptio placentae*; finally, the reaction of the system to the gestation may be abnormal and we observe the toxemias—uncontrollable vomiting, eclampsia, etc.

This brief review of the possibilities which imperil a pregnant woman may suffice to convince the nurse—if that

were necessary—of the importance of prenatal care, and it will show where and how her services will be helpful.

In the large majority of cases serious accident does not occur, but minor discomforts are common—indeed, Mauriceau, a famous French obstetrician, called pregnancy a disease of nine months' duration. Rarely a woman will feel better while pregnant than at any other time, and sometimes pregnancy gives a lasting stimulus to beauty and good health.

MINOR DISTURBANCES OF PREGNANCY

Nausea and Vomiting.—About one-third of pregnant women have this symptom. It varies much in different women and in succeeding pregnancies. If the patient retains most of her food, if the general health is not concerned, the physician usually is not alarmed, but prescribes only mild palliative measures. Such are: (1) Waking the patient at about 6 A. M. and giving her a cup of coffee with a bit of toast, the patient resting an hour or two afterward; (2) counter-irritation over the stomach; (3) the knee-chest position (Fig. 161); (4) mild medicines, as adrenalin, corpus luteum, etc.; (5) liquids; (6) frequent small meals consisting of cereals, sugars, bread-stuffs, honey, fruits, starches, nuts, leafy vegetables, etc.—that is, a carbohydrate diet with limited protein and very little fat.

Edema of the Extremities.—Frequently late in pregnancy the feet swell up, becoming dropsical. The symptom is always important, and it should be reported to the physician. The edema may be due to mechanical obstruction to the return flow of the blood, or it may indicate a beginning pre-eclamptic toxemia, nephritis, or heart disease, and will be the cause of earnest solicitude to the doctor.

Varicose Veins.—Varicosities of the veins in the legs and around the vulva are quite common in advanced pregnancy in multiparae. Primiparae and women who take

good care of themselves are less troubled with them. They are caused by some congenital or acquired abnormality of the walls of the veins, not by pressure. In some cases the enlargement of the veins is so great as to cause real distress, as burning, itching, and pain in the legs and lower pelvis.

The treatment consists in the institution of a hygienic mode of life, as given under Hygiene of Pregnancy (p. 90). There should be no circular constriction at any part of the body, especially no round garters, corsets, or tight



Fig. 157.—The treatment of varicose veins by means of strips of adhesive plaster. Seldom necessary to cover the whole limb.

waistbands. The return of blood to the heart must be unhindered.

The feet must be kept off the floor as much as possible, and rubber stockings or a flannel bandage worn during the day. A flannel bandage does not do any good unless well applied and kept in place. Adhesive plasters give considerable relief in these cases. Strips are cut 1 inch wide and 7 inches long. These are placed in a spiral direction partly around the leg below and over the largest varicosities (Fig. 157). These strips support the column of blood in the veins. They are applied while the patient is recumbent.

The foot of the patient's bed should be elevated 8 inches to relieve the engorgement during the night, and each evening and morning the patient should rest her limbs on an almost vertical support (the ironing board) standing against the head of the bed (Fig. 158). The woman should be cautioned against injuring the enlarged vessels by scratching or striking against objects, as dangerous and even fatal hemorrhage has resulted. The patient is



Fig. 158.—Treatment of varicose veins.

instructed that should such a hemorrhage occur, she should apply firm pressure to the bleeding point and notify her physician without a moment's delay.

Hemorrhoids are varicosities in and around the anus and require the same treatment as under other conditions.

Leukorrhea.—During the first months of pregnancy there is a slight increase in the vaginal discharge, and toward the end also. No treatment is required. If

the discharge is profuse, especially if yellow or greenish, the physician ought to be consulted, as an infection of the genitals may exist which may endanger the patient's health and the baby's eyes. Douches should not be given without the physician's order. Leukorrhea may be caused by pelvic congestion, evidenced by large varicosities.

Pruritus vulvae, or itching of the pudenda, is sometimes a very trying symptom. Without visible lesion of

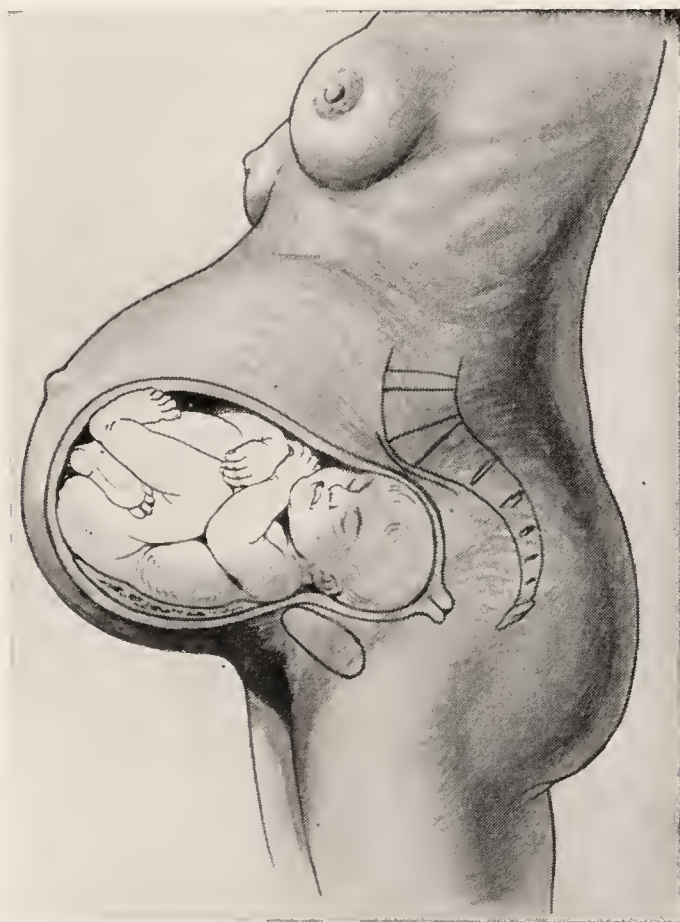


Fig. 159.—Position of the child and the uterus in a case of pendulous abdomen (Dickinson).

the parts the patient is annoyed by a more or less intense itching of the vulva, or it may be general, over all the body. It may be so intense that the woman loses sleep, and it becomes, in very rare instances, unless relieved, a condition dangerous to life. In these cases a nervous element or a toxemia is present. The physician will lay out a course of treatment, but the nurse may use household remedies, such

as bathing with washing-soda solution, weak carbolic solution, peppermint-water, calamine lotion, etc.

If dependent on an irritating vaginal discharge or on "thrush," which sometimes occurs, appropriate treatment is instituted.

Pendulous Abdomen.—This condition, called "rupture" by the laity, is produced by a weakening of the



Fig. 160.—Combination binder or jockey strap applied.

abdominal wall or even a separation of the muscles, diastasis recti abdominis, allowing the uterus to fall far behind (Fig. 159) or even hang down between the knees. It causes drawing sensations in the abdomen, pain in the back, frequent urination, and discomfort in walking. Relief may be obtained by supporting the uterine tumor with an abdominal binder or sling hanging from the shoulder. The knee-chest position aids a little too in relieving the symptoms. Pendulous abdomen in a primipara indicates that something is wrong, possibly contracted pelvis, placenta praevia, or a tumor blocking the entry of the head into the pelvis. It may render labor difficult. To a

certain extent it is preventable by graduated bed exercises, postpartum, moderate elastic support (Fig. 160), attention to the bowels, and supervised athletics.

Pains in the Abdomen.—Many women complain of pains in various parts of the abdomen. These are due to

intestinal colic, impaction of feces, appendicitis, traction on adhesions, stretching of the abdominal wall, wearing of corsets or tight waistbands, carrying infants on the uterine prominence, and varicose veins in the pelvis. With the cause, the nurse will find the remedy. The knee-chest posture will relieve pressure symptoms; laxatives are exhibited, and hot camphorated oil, chloroform, or other liniment applied to the skin. If marked and constant, the physician ought to be informed of it.

Heartburn.—Indigestion, gastric distress, and heartburn are frequent and annoying symptoms in pregnancy. The physician will prescribe the usual remedies. Home remedies that give relief are: the antacids, soda-mint tablets, 1 to 3 dissolved in the mouth, olives and salted nuts chewed fine, and milk of magnesia, 1 to 3 dessert-spoonfuls, or baking-soda as needed. A plain diet is ordered with the fats omitted and six small meals eaten instead of three large ones. Sometimes dilute hydrochloric acid, mx , t. i. d. a. c., will give relief. Rarely gastric lavage is needed.

The **teeth** in some patients show a tendency to decay. Cavities should be filled and bad teeth extracted as in the non-pregnant state, but long, tiring gold fillings and bridge work should be postponed. Milk of magnesia held in the mouth for three minutes three times a day will relieve the acidity of the saliva and help preserve the teeth. Calcium may be given by mouth to supply the problematic amount taken by the growing fetus, but a diet rich in lime is better—milk, eggs, cereals, spinach, green vegetables, etc.

Frequent Urination.—In the first few months this is a common symptom. It passes away, to return again when the head sinks in the pelvis at the time of lightening. If the condition is aggravated, destroying the patient's peace by day and her rest by night, the physician should be consulted. It is sometimes due to the uterus being turned back and imprisoned in the pelvis, the malposition distorting and compressing the urethra. The bladder fills almost to

bursting and then overflows (ischuria paradoxa). The catheter should always be used to aid the diagnosis, but extreme care should be taken not to injure the urethra by making a false passage. Cystitis and ureteritis may occur. If there is no pathologic basis for the frequent urination, the knee-chest posture will relieve the discomfort somewhat.

Fainting.—Some women are much annoyed by this condition. Without apparent cause, or on the occasion of a little excitement, or by being in a close room, the gravida feels faint, and may even fall to the ground. In a few moments the attack has passed.

The writer has observed this condition. It is not a real swoon, as the pulse is good and the face only slightly pale, though in some instances it may be an actual syncope. Consciousness is not always lost. One must be sure that there is no real heart disease present.

This symptom may be present from the fourth month; it does not influence the pregnancy, though most distressing to the patient. The diet should be regulated—no over-eating; the excretions should be stimulated; the patient should avoid crowds, excitement, and irrational dress. The harmlessness of the condition should be explained to her to allay the alarm it naturally causes. The gravida should carry a little bottle of smelling salts to be used when she feels the faintness approaching, and if the attacks are frequent should not go out unaccompanied. The physician occasionally prescribes a tonic.

Backache is due to many causes, *e. g.*, softening of the pelvic joints and sacro-iliac strain; high heeled shoes which incline the trunk forward and necessitate throwing the shoulders back to keep the balance; pendulous abdomen; ureteritis and pyelitis; general muscular weakness aggravated by pregnancy. A tight pelvic girdle will relieve the first condition, proper shoes the second, a binder the third, medical treatment the fourth, and some form of back support, rest, massage, etc., the last one.

THE GRAVE DISTURBANCES OF PREGNANCY

The Toxemia of Pregnancy.—Toxemia means the presence of toxins or poisons in the blood. A better term is “toxicosis,” which means a disease caused by toxemia. Under the general term “toxemia” are grouped a multitude of symptoms and several clear-cut diseases. We may mention a few of the toxemic manifestations—headache, tingling in the hands, neuralgias in various parts of the body, nervousness, rapid pulse, symptoms which resemble hyperthyroidism, puffiness of the skin or edema, asthmatic attacks, salivation, mild nausea, and vomiting. Of the clear-cut toxicoses, pernicious vomiting or hyperemesis gravidarum and eclampsia claim first notice because they are most frequent and dangerous.

Other toxemic diseases are chorea and acute yellow atrophy of the liver, multiple neuritis, and certain psychoses in pregnancy. These are not peculiar to the pregnant state, since they occur in males, but are superinduced and aggravated by the disturbed metabolism of gestation.

We speak glibly of toxins circulating in the blood, and in all probability the toxicoses are thus produced, but we do not know where these poisons come from or what is their chemical nature. Some resemble strychnin and produce convulsions, others resemble morphin and produce coma, some nicotin, and produce vomiting. They may be the result of abnormal metabolism, they may come from the child, or from the placenta from pathologic chemical changes here; they may be absorbed from constipated bowels; they may be the results of disordered functioning of the endocrinal glands, the corpus luteum, the ovary, the thyroid, the pituitary; they may come from a focus of infection, an abscessed tooth, tonsils, or gall-bladder; they may be the accumulated waste from the mother or from the child, which her excretory organs, especially the liver and kidneys, because of some inherent weakness, have failed to convert and eliminate. Wherever they come

from and whatever be their nature, the present belief is that they are there, in the blood, circulating all the time in increasing amounts and damaging the liver, so that it cannot properly convert them into harmless substances which the kidneys can eliminate. The latter, therefore, secondarily, degenerate, and thus the poisons, which they ordinarily would filter out and get rid of, also accumulate in the system, making the toxemia much worse. These toxins affect the brain and spinal cord, causing convulsions and coma (eclampsia), or the vomiting center, and cause hyperemesis gravidarum, or the seat of the psyche and cause mental diseases, and so on.

While it would help immensely if we knew all about toxicity of the blood, we at least are happy to be able through prenatal care to early recognize the first symptoms of the various toxicoses, and by medical treatment and good nursing either cure them, or, by interrupting the pregnancy, prevent a fatal issue.

Every year between 4000 and 5000 women die of eclampsia in the United States. At the Chicago Lying-in Hospital in 34,807 obstetric cases there were 155 of eclampsia. Ten mothers died. A critical analysis of these cases shows that most of them did not have adequate prenatal care. Either the women themselves were negligent and did not come to the clinic regularly, or refused to permit induced labor when symptoms threatened, or the attending physician was negligent and did not heed the warnings of impending convulsions. Only 3 (possibly 2) deaths occurred when there had been good co-operation of patient and doctor. If the nurse will contrast these two facts she will realize the value of prenatal care in this one field alone, and since in the rural districts it is the nurse to whom we must look for the betterment of the condition of pregnant women, the opportunity for real and lasting service is thus presented.

Hyperemesis Gravidarum.—This is the toxemia of early pregnancy. Its main symptom is vomiting, which gives

the disease its name, but the prostration, the delirium, the neuritis and psychoses, and renal changes show that the poisons work on many vital organs. It is not easy to tell when the mild nausea and vomiting of which so many gravidæ complain passes over into the pernicious or uncontrollable. The following symptoms may be noted: Constancy of nausea and great frequency of vomiting, incessant retching; exhaustion; loss of weight and sleep; salivation; hematemesis; fever, and rapid pulse. The last three show that the disease is far advanced, especially if albumin, casts, blood, bile, and acetone bodies are found in the urine. Unless soon relieved the patient will die under the clinical picture of acute starvation, or exhaustion, or, rarely, convulsions.

Cases of hyperemesis can be divided into four classes: first, those in which the vomiting is due to some cause which would evoke vomiting outside of the pregnancy, *e. g.*, appendicitis, gall-stones, gastric ulcer, nasal disease.

Second, those cases in which some irritation of the genitals, such as retroflexed uterus, a fibroid, chronic cervicitis, causes vomiting reflexly through the sympathetic system.

Third, those due to the diseases of the nervous system—organic, where there is a brain tumor, or meningitis; and functional, either a neurosis or a psychosis. Hysterical or neurotic women are especially predisposed to hyperemesis and, as the psycho-analysts have shown, the vomiting may be a protest, conscious or subconscious, of the woman against the pregnancy, a sort of “hunger-strike.” The pregnancy is either fearful or abhorrent to the woman and she wishes herself rid of it, or she sincerely desires the child, but the fear of labor and the inconveniences of motherhood provoke a mental conflict whose outward expression is this upset of the nervous system. We might call this neurosis “pregnancy shock.” It is similar, in a way, to the war neuroses and psychoses which the boys in the training camps showed even before they ever smelt powder.

Fourth, the large majority of all serious cases are of toxic origin—they are true toxicoses. In the mild cases also toxemia is a contributory factor, but we usually find the woman has a neurotic constitution. If we can cure the nervous condition she herself overcomes the toxemia.

The physician will try to find out which is the underlying cause of the vomiting in each case, and in this the nurse will help him. Her observations of the symptoms, of the effects of the treatment, and her insight into the workings of the patient's mind will be very valuable. At the beginning it is seldom possible to determine the exact nature of the vomiting, that is, whether it is toxemic, or neurotic, or reflex. Therefore, the treatment at first is on general lines, as here presented, and is directed more specifically at the cause when it is disclosed.

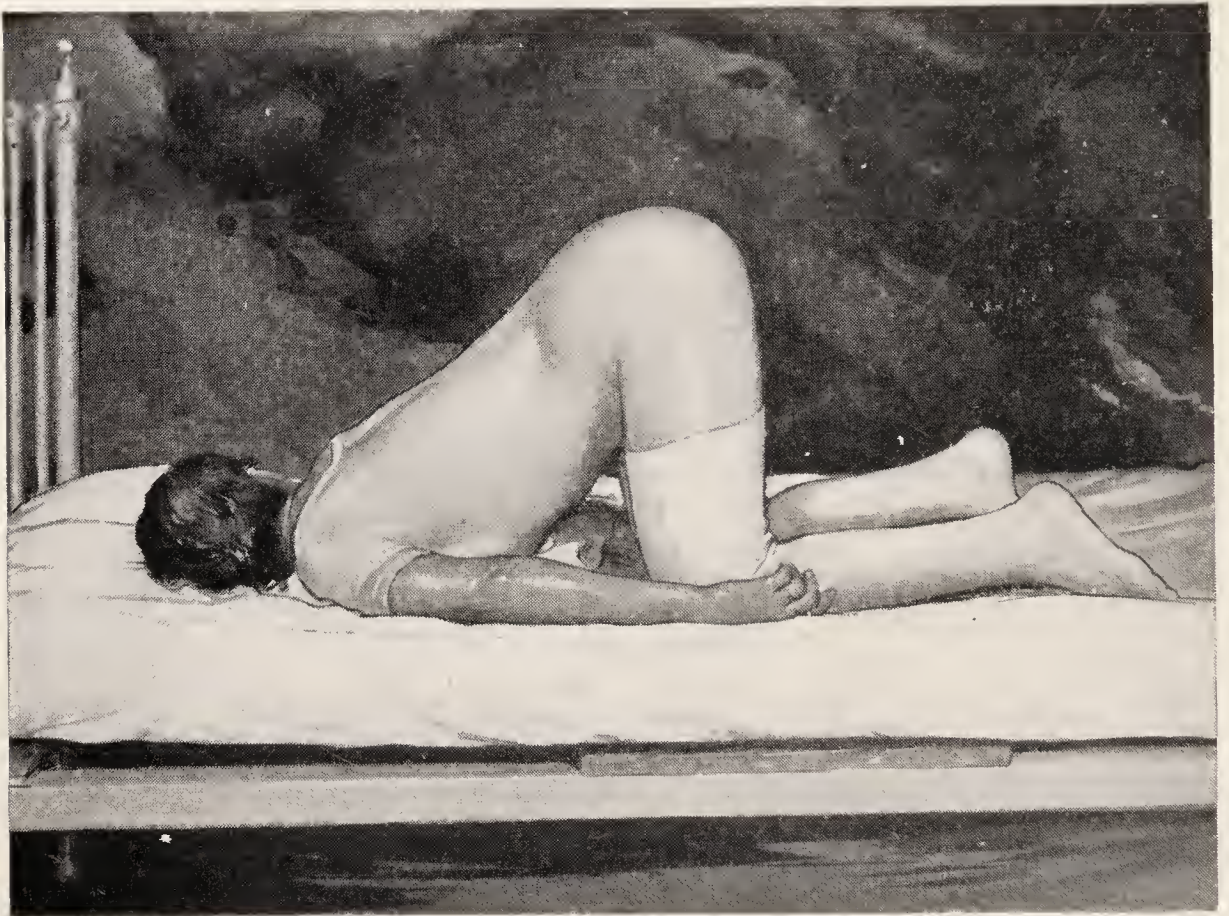


Fig. 161.—The knee-chest position.

The nursing of a case of hyperemesis gravidarum requires the highest kind of nursing skill and culinary ability.

The pleasantest and airiest room in the house should be selected for the patient. It should be darkened. She should be left alone with her nurse, all friends and nearly all relatives being excluded. It is sometimes beneficial to exclude every one—the husband also—for a week or more. The nurse should distract the patient's mind from herself and from the idea of vomiting; therefore the emesis basin should be hidden until actually required.

The nursing of the patient's mind is a large part of the duties of both physician and nurse; indeed, the author is convinced that he has cured more cases by psychotherapy than by any other means. It is not the parrot-like reiteration that the patient is going to get better that produces the result, but the sympathetic, optimistic, and reassuring attitude of the physician and nurse, which impregnates the mind and spirit with confidence, hope, and the conviction of recovery.

The nurse may need to help one mother reconcile herself to the idea of pregnancy; she may calm the fears of approaching labor harbored by another; she may be able to cure a morbid outlook on life and maternity by pointing out the marvelous and spiritual beauties of the function, or by word and action so encourage and support a mother, distracted by the too many demands made upon her mental and physical resources, that she is able to resume her burden and "carry on."

Nourishment must be supplied if the woman is to live, and the nurse should keep a careful record of the amounts of food ingested, the amount rejected, and that absorbed. The appetite is tempted with light foods served in the daintiest possible manner, using the whitest linen and the prettiest dishes. Occasionally a few sips of champagne may settle the stomach, so that food can be retained. Morphine is sometimes given but we rely more on bromide (per rectum) and luminal intramuscularly.

At the beginning the following may be the dietary:

Milk and lime-water or seltzer, ice cold.

A strong beef-broth served in a cup, with salted wafers.

Cold custard.

Rice and milk, with cinnamon.

A sliver of white meat of chicken, with buttered toast.

Strong oyster broth.

Strained oyster-stew.

Toast and hot milk, with sugar.

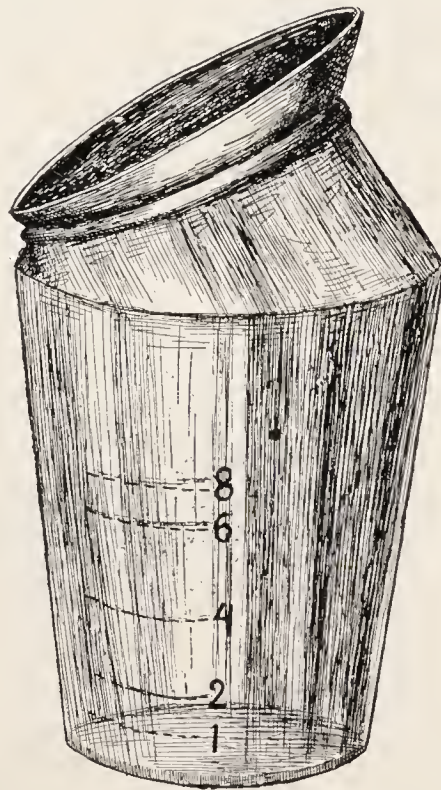
Ice-cream and ices.

Frozen milk or cream.

Cream soups, with wafers.

The food should be given while the patient is in the horizontal position, and she should lie perfectly quiet for a few minutes afterward. The "Ideal" drinking glass (Fig. 162) is very convenient for drinking in this position.

Should these measures fail, liquid diet will have to be ordered. This consists of milk, milk and seltzer or lime-water, peptonized milk, plenty of water, beef, mutton, and chicken broths, albumen-water, sugar-water, barley-water, and beef-juice. One of the late methods is to administer large amounts of sugar on the theory that the



. Fig. 162.—The "Ideal" drinking glass.

liver changes are due to the lack of glycogen. Lactose solution is given by mouth, and glucose by rectum, hypodermically, by nasal or duodenal tube, and intravenously.

Some patients do better on solid food, toast, crackers, and meat, the liquids being supplied by rectum or given between meals.

If the patient vomits in spite of all this, the physician will usually order everything by mouth stopped and rectal feeding instituted.

Innumerable medicines are given by mouth and per rectum and a large variety of treatments administered—at which the nurse may assist. If there is demonstrable pathology in the genitals, it is corrected, *e. g.*, erosions are touched with nitrate of silver, a retroflexed uterus elevated with a pessary, etc. A chronic inflamed appendix and gall-stones are removed and a sinusitis treated.

If the case is neurotic the mind will be soothed by psychotherapy and starvation combated by diet, duodenal feeding, etc. If a toxemia exists an attempt to cope with it will be made by giving saline solution per rectum and percutaneously, aided by copious colonic flushings with bicarbonate of soda solutions together with many of the remedies above mentioned.

In rare cases all these measures fail, the vomiting is intractable, perhaps bloody, and to it is added a distressing retching. Sleeplessness and prostration increase the poor woman's misery and she may long for death to relieve her sufferings.

Physicians seldom allow patients to arrive at such a state, as a turn for the worse may come on suddenly, and the patient be lost before measures for saving her can be instituted. Occasionally, even when conditions appear quite serious, the woman suddenly ceases to vomit, demands food, and retains it. Sometimes a psychic shock, or mental influence, or the phenomenon of "quickenings" must be accepted as the cause, and not the doctor's medicines.

Should a consultation of physicians decide to terminate the pregnancy as the only hope of saving the patient, the nurse will set about preparing as for a major operation. (See Therapeutic Abortion, p. 326.)

Shock is marked in these cases, and ample provision ought to be made to combat it. After the operation the

vomiting nearly always ceases or becomes less. Was the operation performed too late, acute exhaustion supervenes and the patient sleeps away. Careful nursing after the operation is needed, and all the intricate arts of the cook will be useful. Nourishment should be given as previously indicated. If the rectum tolerates it, rectal feeding is practised in addition, and injections of benzoated lard are made. Some of the lard is absorbed as a food. To supply liquids to the body salt solution may be given by the drop method per rectum or by hypodermoclysis, and everything done to bring the patient quickly back to a normal state of nutrition.

Prevention of Decubitus.—The sacrum and bony prominences must be inspected several times daily and an incipient bed-sore treated at once. Frequent change of position, the use of air-cushions, an invalid bed, and absolute cleanliness will prevent decubitus. Daily washings with 15 per cent alcohol, followed by a gentle rubbing with sterile olive oil, will aid in prevention.

The mouth in case of hyperemesis becomes reddened, tender, often bleeding, and teeth and lips accumulate sordes. If the patient becomes delirious, the resemblance to a typhoid case is striking. The nurse cleans the tongue and gums carefully (as the mucous membrane is easily scratched) with borie acid solution containing 3 per cent lemon juice. No brush may be used on the teeth. The finger is covered with a napkin or pledget and is gently rubbed over them. Care is to be taken to prevent the patient from gagging. Throughout such a case the nurse should see that the patient gets sleep, here, without doubt, nature's sweetest restorer.

Pre-eclamptic Toxemia.—Late in pregnancy another form of toxemia sometimes appears. It is evidenced by pallor, edema of the feet and eyelids, rising blood-pressure, albuminuria, and the symptoms are headache, malaise, sleeplessness, nervous excitability, anorexia, etc. It is vari-

ously called pre-eclamptic toxemia, pregnancy nephrosis, or eclampsism. The first name is the best because this form of toxemia is simply the prodromal stage of true eclampsia. If the patient is not given proper treatment the pallor, edema, and albuminuria increase, and to the above-mentioned symptoms are added spots before the eyes, blurred vision, even blindness, ringing in the ears, nausea and vomiting, twitching of the muscles, *pain in the epigastrium*, drowsiness, or a tendency to coma. These symptoms indicate that eclampsia itself or the convulsion is imminent. Sometimes the toxins kill the baby, whereupon the symptoms usually abate. Later a macerated fetus is expelled.

If the patient does not respond to treatment, or if the pregnancy is not artificially terminated she goes from bad to worse and suddenly falls into convulsions, or, rarely, into coma—eclampsia without convulsions, and dies. This means that the eclamptic toxins, similarly to other poisons, such as arsenic, strychnin, have accumulated to the extent that the nervous system is saturated.

Eclampsia may be defined as a disease of late pregnancy, labor, and the puerperium, marked by convulsions, coma, fever, and probably due to a toxemia. The word eclampsia means to flash out, and has reference to the suddenness with which the patient is prostrated, but it is a misnomer, because there are usually plenty of warnings which herald the catastrophe.

Symptoms.—Eclampsia may occur during pregnancy, labor, or the puerperium. It is rare after delivery and less frequently fatal. Primiparae suffer more often than multiparae. The premonitory symptoms or the prodromal stage of eclampsia may last from a month to only a few days, or it may burst out in a few hours, as the name indicates. Usually the warning signs above mentioned are present for days, but are unheeded, and the family is surprised and horrified by the gravida falling down unconscious in a convulsion. She may fall against a table or stove and

do herself damage, especially if alone at the time. The mouth is drawn to the side, the facial muscles twitch, then the arm, next the leg, then the whole body is shaken violently by strong muscular spasms. The patient may bite the tongue severely and bloody foam appears on the lips. This part of the spasm is succeeded by a period of rigidity. The patient is stiff, the respiration ceases, and the body becomes cyanotic. The heart beats violently and then weakens, and the patient may die in such a convulsion. Though it seems much longer, the spasm seldom lasts more than sixty seconds, and at the end the patient takes a deep inspiration. The breathing now becomes stertorous or snoring, the cyanosis mostly disappears, and the patient lies in deep coma. This coma may last an hour or longer. Another convulsion may occur in twenty minutes to a few hours, or there may be only one or as many as a hundred, though seldom more than twenty. The seizures may recur the next day or next week. The greater the number of the convulsions, the greater is the danger. Deep coma and great cyanosis likewise give a gloomy outlook.

If the patient has a strong, regular pulse, running not over 110, with red face (not cyanosis), the promise is good for recovery. If she develops edema of the lungs, death almost always results.

If the convulsions increase in severity and number, (above twenty), if the pulse grows more rapid, the fever rising, the coma deepening, the outlook is sadder. One can hope for recovery if the patient begins to pass clear light colored urine and the intervals between the fits grow longer. Consciousness may return in six hours to three days, memory is slower.

Treatment.—*Prevention.*—If a nurse has ever witnessed an eclamptic convulsion, she will resolve never to permit such a painful and unforgettable occurrence again. And this resolution will be fruitful, because of all things prenatal care can do, this is one of the most promising. Every

pregnant woman should be looked upon as a candidate for eclampsia and the routine antenatal visit is focussed on this fact. In addition to the insistence that the hygienic rules of pregnancy be observed, the nurse will seek the symptoms of pre-eclamptic toxemia at each consultation (edema, pallor, rising blood-pressure, albuminuria, headache, blurred vision, etc.). Immediately one decides that a toxemia is beginning, preventive treatment is begun. The patient is usually put on a pre-eclamptic diet (p. 591)—on the theory that it is the general metabolism that is at fault—and the salt intake is reduced to clear up the edema. Usually the patient is put to rest in bed. The French treatment is absolute milk and water diet: the Germans actually starve the woman for two to four days; many limit the food intake to vegetables, fruit, and water, others water and sugar, and more food as improvement occurs. Some physicians believe eliminative treatment—bleeding, hot packs, cathartics; colonic irrigations, and diuretics—get rid of much poison; others do not believe in elimination, except that which naturally follows the ingestion of much fluid. Sometimes, depending on how close to term the patient is, these measures will tide her along until labor begins or until the child is viable and labor can be induced. If in spite of all treatment the patient grows steadily worse, labor is induced before convulsions break out, which is a great accomplishment, as the mortality of eclampsia is 6 to 20 per cent.

Curative Treatment.—After the convulsions have occurred the case immediately assumes a grave aspect and requires the continuous attention of both doctor and nurse. The physician must decide on a plan of treatment and he has three from which to choose, all supported by good authority. Stroganoff's, or the non-operative method, is to give morphin and chloral, absolute quiet, venesection, thus keeping the convulsions under control until the labor can be terminated without operation or with a minor one. The idea is that

eclampsia is a self-limited disease and that the injury and shock of operation may make it worse, not better. Another method, the active one, is to empty the uterus as soon as possible after the first convulsion either vaginally or abdominally. The theory is that the pregnancy is causing the toxemia which causes the eclampsia, and since we have no antidote for the poisons which circulate in the blood, we can remove the pregnancy which gave rise to them.

The third method individualizes the cases, and gives morphin and eliminative treatment for the one and delivers the child, in the other, more or less rapidly.

The duties of the nurse will vary according to the plan adopted by the doctor. If operative delivery is decided upon, she may have to prepare for abdominal or vaginal cesarean section, for incisions of the cervix and forceps, or, if the mildness of the symptoms justifies a slower method, for the induction of labor by bags. If medical treatment is to be instituted, her part in the program will be first to help in keeping the spasms under control by the administration of narcotic drugs—morphin, magnesium sulphate, chloral, bromids, rarely chloroform and ether, and by shielding the patient from all external excitants and irritations; second, to aid in the attempt to get rid of the poisons through the emunctories—by giving hot packs, colonic irrigations of saline or 2 per cent soda solution, gastric lavage or feedings, and assisting with hypodermoclysis, venesection, intravenous therapy with sugar, etc. Occasionally spinal puncture or decapsulation of the kidneys is performed as a direct curative measure.

General Nursing.—In all cases the nurse's first care is to prevent the patient from injuring herself. She must be placed in bed, with many soft pillows, and covered warmly. The patient must not be left alone one minute. The room must be darkened, and *all noises shut out. No talking, jarring the bed, or slamming of the doors may be permitted* since the slightest irritation may cause a spasm.

Only the nurse and the physician should be with the patient. Great care must be taken that she does not bite her tongue; this is a real danger, as it may lead to oral infection and pulmonary abscess. If the patient has false teeth, they should be removed; if bridge work or crowns, the nurse takes care that they are not broken. The best method of preventing injury to the teeth and tongue is by means of an ordinary wooden clothes-pin (Fig. 163). This is covered



Fig. 163.—Prevention of tongue injuries by means of the clothes-pin. The covered clothes-pin is the one used. Photograph of eclampsia case taken during the stage of stertorous breathing.

with a piece of gauze sewed on tightly, a string is tied to it, and it is hung near the head of the bed, *within easy reach all the time*. When the patient opens her mouth, as is usual at the beginning of the convulsion, the clothes-pin is placed between the jaws, so that when the muscles contract they bring the teeth together on the prongs of the pin, the elasticity of the prongs preventing injury to the teeth, jaws, and tongue. A large cork attached to a string may



Fig. 164.—A strip from a motion picture of a case of eclampsia, showing the extreme jactitation between convulsions.



Fig. 165.—Close up of same patient shown in Fig. 164 taken right after a convulsion. Note foam on lips.

also be used, but not the handle of a knife or a steel mouth-gag. When restraining the patient's wild movements it must be done with extreme gentleness because resisted motion causes dilatation of the heart.

If the patient is to be taken to a hospital she is usually given a large dose of morphin first, wrapped warmly in blankets, ensconced in pillows, and accompanied by the doctor or nurse, who is provided for emergencies. That the transfer be accomplished with the very least possible shaking up is hardly permissible to say.

During the progress of the case the patient may have had cathartics, and, being comatose, the movements occur in the bed. When changing the patient, great care must be taken to prevent infection of the vulva, and also to avoid jarring her too much, because it sometimes brings on convulsions.

Sometimes the patient is given hot wet or dry packs to promote diaphoresis, and thus excretion of toxins by the skin. The nurse must not allow a hot pack to last over twenty minutes; she must keep an ice-bag on the head or a cold wet towel around the neck, and she must watch the patient continually, because sometimes death from heart failure or cerebral hemorrhage occurs during the sweating process. If bricks or hot iron are used for the hot pack, the nurse must see that they do not burn the patient. In her tossing about and in the convulsions the patient displaces the blankets; severe burns have thus been caused. When the pack is removed, great care is to be taken to avoid chilling. Many physicians do not approve of sweating eclamptics, holding that the dangers above mentioned are too great, that the amount of poison thus eliminated is infinitesimal, and the concentration of the blood by the loss of fluid increases its toxicity, and invites coma.

Fresh Air.—Oxygen may be given if the patient is cyanotic, but if the nurse will keep the air in the room always fresh this is unnecessary. If the patient develops edema of the

lungs, the nurse turns her on the side with the head hanging over the edge of the bed, so as to allow the frothy mucus to run out of the mouth (Fig. 166), or employs a suction pump, like for a tonsil operation. The shoulder must be supported or the patient's breathing will be interfered with.



Fig. 166.—Treatment of vomiting in a semi-conscious patient. Head is supported, and the nurse raises the shoulder so as to allow free expansion of the chest. To remove rattling mucus from the throat and thus reduce the danger of aspiration pneumonia the nurse may use a suction pump as is done in tonsil operations.

If the tongue of a comatose patient falls back into the throat, asphyctic conditions may arise. The jaw should then be held forward to free the respiration. Eclampsia is an awe-inspiring condition, and the patient's life, as well as that of her child, often depends on the coolness and judgment of their attendants.

On Guard!—When morphin, chloral, veratrum, etc., are given, the nurse must study the effect of these drugs, because they may act with unusual strength. All these medicines and all the treatments, the number of convulsions, and condition of the patient should be recorded carefully on the history sheet.

The nurse must watch closely for signs of beginning labor and apprise the physician at once of this fact. Labor in eclamptics is often very rapid and the nurse's duties are now doubled. It will be wise for her to prepare for delivery much earlier than in a normal case, because the child may come precipitately, it may suddenly show signs of asphyxia, or the condition of the mother may grow rapidly worse—indicated by repeated convulsions, deepening coma, rapid heart, edema of the lungs.

Diet.—Usually no nourishment is given until the patient can swallow, unless by stomach-tube, and throughout the nurse must exercise great vigilance to prevent water, medicine, mucus, and blood from the mouth and throat being drawn into the lungs. This is a serious matter, causing bronchopneumonia and often death. When the woman awakes from the coma sufficiently to swallow, water, sugar-water, or lemonade may be given; food only tentatively and on the doctor's order.

Some important "don'ts" for the treatment of an eclamptic:

1. Don't let the patient bite her tongue or hurt herself.
2. Don't restrain the convulsive movements with too much force.
3. Don't leave an eclamptic alone one minute.
4. Don't give an unconscious patient liquids or food by mouth except by stomach-tube.
5. Don't irritate the patient by jarring the bed, by noise, etc.
6. Don't let the baby be born under the bedclothes.
7. Don't burn the patient with hot-water bags, etc.

Convalescence.—Recovery from this alarming disease often occurs with surprising and gratifying rapidity. Natural sleep begins sometimes within a few hours after delivery, the convulsions cease or recur at lengthening intervals and signs of returning consciousness appear—usually within two days. The patient passes large amounts of clear urine, the albumin diminishes, the blood-pressure



Fig. 167.—Giving magnesium sulphate and other irritating medicines intramuscularly. The long needle goes almost straight in and is withdrawn a short distance very slowly while the injection is being made. Don't let any fluid escape into the fat or skin! Don't break the needle off!

subsides, the blindness disappears. But the nurse may not relax her vigilance, because the fits may recur, even after three weeks, on the occasion of an error of diet, excitement, or some factor unknown. One true eclampsia confers immunity from subsequent attacks, but if the woman has a latent nephritis she may have convulsions when she becomes pregnant again.

The child is not to be allowed to nurse till consciousness has been clear for several days, and the first milk should be pumped and thrown away, as it may cause illness, perhaps convulsions, in the baby. The mother may repudiate her own child, which should give rise to the suspicion that insanity is threatening. Mental aberration is a not uncommon sequel of eclampsia, and occasionally the memory is weak for months.

Chronic Nephritis.—A woman may have impaired kidneys and not know it, but when a little additional burden is placed on them the latent disease becomes apparent. The symptoms appear usually about the middle of pregnancy. Edema, pallor, albuminuria, and high blood-pressure are followed by the same symptoms we learned under pre-eclamptic toxemia, only later in the course of the disease—headache, nausea, blurred vision, even blindness, and, in rare cases convulsions. The nurse has seen men with uremic convulsions. The cases are similar. Since the kidneys cannot filter out the normal waste products of metabolism the latter accumulate in the system causing uremia, a form of toxemia. This toxemia usually kills the baby if its life has not already been compromised by white infarcts in the placenta which interfere with the oxygenation of the fetal blood and the food transfer. Repeated pregnancies have a bad effect on kidneys already diseased—indeed, the impairment of the organs may only be apparent at these times, and each child shortens the woman's life a little. Repeated stillbirths may be due to chronic nephritis.

The main dangers of nephritis during pregnancy are: enormous anasarca, edema of the lungs, retinitis which may lead to permanent blindness, apoplexy, acute heart collapse, and uremic convulsions, sometimes called nephritic toxemia. Convulsions occur in less than one-third the cases of nephritis in pregnancy, but if the gravida should have them, unless we knew her kidneys were previously disabled, we could not distinguish them from true eclampsia, but we do not have to, since the treatment is the same. During convalescence, however, we can tell one from the other. The symptoms clear up quicker in eclampsia. The blood-pressure comes down, the edema and albumin have almost gone by the fourth week, whereas if there is a nephritis the blood-pressure remains high, and the impaired vision, the albuminuria, and other urinary findings may never completely disappear.

Treatment.—A woman with chronic nephritis should not marry; if married, should not conceive, if she becomes pregnant she must at once place herself under the care of a competent internist and obstet-

rician. An attempt is usually made to tide the patient along until the child is viable, but, unfortunately, it seldom succeeds, and either the mother develops threatening symptoms or the baby dies in the meantime. The nurse placed in charge of a case of nephritis in pregnancy, besides the execution of prescribed medical treatment, of diet, hot packs, etc., about which expert opinion is continually changing, should watch particularly for the signs of the dangers which threaten the mother and baby, especially cardiac failure and convulsions. See Pre-eclamptic Toxemia for the symptoms. If the condition of the woman becomes so alarming that pregnancy must be interrupted, she may be required to prepare for induction of labor or some form of cesarean section. In the event that convulsions have broken out the nursing care is identical with that of eclampsia.

Hemorrhages During Pregnancy.—The whole reproductive cycle is attended with the possibility of hemorrhage from the genitals. In the early months abortion and in the later months placenta praevia and abruption of the placenta, may be the cause of the hemorrhage.

Abortion.—This means the interruption of pregnancy before the seventh month. The child is not viable before the twenty-eighth week.

Symptoms.—Abortion may be only “threatened,” that is, the woman has light uterine contractions, miniature labor-pains, and a little bleeding from the uterus; abortion may be “in progress” when the pains are strong and regular, bleeding more free, and the cervix beginning to open for the exit of the ovum; it may be “incomplete” when the fetus has been expelled, but more or less of the placenta is retained. “Septic abortion” is when the process is complicated by infection. It is a dangerous combination. “Missed” abortion means that the process, having started, stops, the child dies, and is retained *in utero*. It may be thus retained for months and be mummified, or for years and be calcified—“stone child,” or lithopedion, or it may become infected and be the source of serious disease.

The causes of abortion are many, injury, usually criminal interference, heading the list. It is very sad to contemplate the thousands of delicate little lives destroyed every year by criminal abortionists,

and, too, the maternal deaths they cause—to say nothing of the life-long invalidism that follows in the wake of these ugly operations. Falls, blows, overexertion, mental shock, etc., seldom cause abortion unless the patient is predisposed by disease of the uterus or some general malady. A slight jar may bring on a miscarriage in such a woman, and a great shock may not do it in another—*e. g.*, a milkmaid was tossed by an angry cow over a fence and terribly lacerated by a horn penetrating the vagina, but she did not abort, delivering a fine child at term.

Diseases of the uterus—infantilism, retroversion, endometritis, and cervicitis (infection)—are well-known causes of abortion. Women with general infections—typhoid, tuberculosis, syphilis, (here usually after the fifth month) and other chronic maladies, heart failure, Bright's disease, pernicious anemia, etc.—are likely to have miscarriages.

Malformations of the fetus are frequently discovered in abortions. Evidently nature determined they were not fit to live and thus eliminated them. A woman should never be told she has produced a monster—it hurts her finer sensibilities, and she will always be apprehensive that the monstrosity will recur in subsequent pregnancies.

The nurse's duties in abortion are preventive and palliative. One of the fundamentals of prenatal care is the prevention of abortion and the nurse will therefore instruct the gravida in the hygiene of pregnancy, particularly regarding exercise, rest at the menstrual periods, etc. If a woman has had previous abortions the physician will search out and remove the cause with a view to preventing another one, and will prescribe a regimen and appropriate medicines to be taken throughout pregnancy.

The nurse, finding the woman threatened with abortion, should put her to bed and send for her physician. If the woman is bleeding too profusely, she should, while waiting for him, pack the vagina as tightly as she can with sterile cotton, under the usual asepsis, or send for the nearest doctor. Then she should prepare everything for the operation, so as to avoid delays when the physician arrives.

Premature labor—*i. e.*, the interruption of pregnancy after the twenty-eighth week and before the thirty-eighth

week—is treated exactly like labor at term plus provision for a small, weakly infant. The tiny morsel of humanity should be quickly and gently smeared with warm benzoinated lard; this is wiped off carefully with a hot soft towel, then the little body is wrapped smoothly in a pure soft wool dress and blankets, and placed in a previously prepared warm nest or the incubator. (See chapter on Premature Infants.)

The causes of the termination of gestation after viability but before term are, in general, the same as for abortion, but syphilis, nephritis, infections of the mother transmitted to the child, placenta praevia, detachment of the placenta, twisting of the umbilical cord, named in the order of their frequency, are more likely to occur during this period.

Placenta Praevia.—This is the development of the placenta, in part or *in toto*, in the lower uterine segment. Thus a portion of the placenta comes to lie over the internal os, in the way of the child, and thus the name “praevia” (Fig. 168).

The placenta is normally located near the top of the uterus out of the way of harm, but when it is placed near the cervix—that is, in placenta praevia—it is loosened from its attachment when the os begins to dilate, thus causing “unavoidable” hemorrhage. The condition is serious, published statistics giving a maternal death-rate of from 10 to 38 per cent, and a fetal death-rate of 50 per cent.

If a woman has one, and especially if she has more than one, uterine hemorrhage in the latter half of the pregnancy, it is usually due to placenta praevia. Of course, if a woman bleeds from hemorrhoids, it is not in this category. A *painless, causeless, uterine* hemorrhage in the last three months of pregnancy almost always means placenta praevia.

Treatment.—Should a patient, either in a hospital or, kept in bed at home, be under observation for suspected placenta praevia, her life may be in the nurse’s hands. She will instruct the patient to tell her immediately when

she feels fluid escaping from the vulva, will frequently inspect the pad herself, will instruct the other nurses on the floor to do the same in her absence and will report at once any bleeding, however slight, or the discharge of beef-juice-like fluid. This may be the liquor amnii, but it also



Fig. 168.—Central placenta praevia (Hunter), the os completely covered. Partial, or incomplete placenta praevia means that the os is only partly overlapped by placenta, and if only the lower margin of the placenta can be felt we call it placenta praevia marginalis.

may be the serum expressed from a large life-sapping clot concealed in the vagina. Besides this watchfulness and the usual nursing care, rest should be absolute, and provisions held close at hand for combating hemorrhage, such as sterile speculum, packing forceps, gauze, etc., for tam-

ponade. If she is the only one present during a severe bleeding, to tampon the vagina and to elevate the foot of the bed would be her only recourse.

The treatment of placenta prævia by the physician consists of, first, Braxton Hicks' version and pulling down the baby's thigh against the placenta, the pressure stopping the bleeding; second, the introduction of a colpeurynter as was described on p. 323, the bag acting likewise by compression

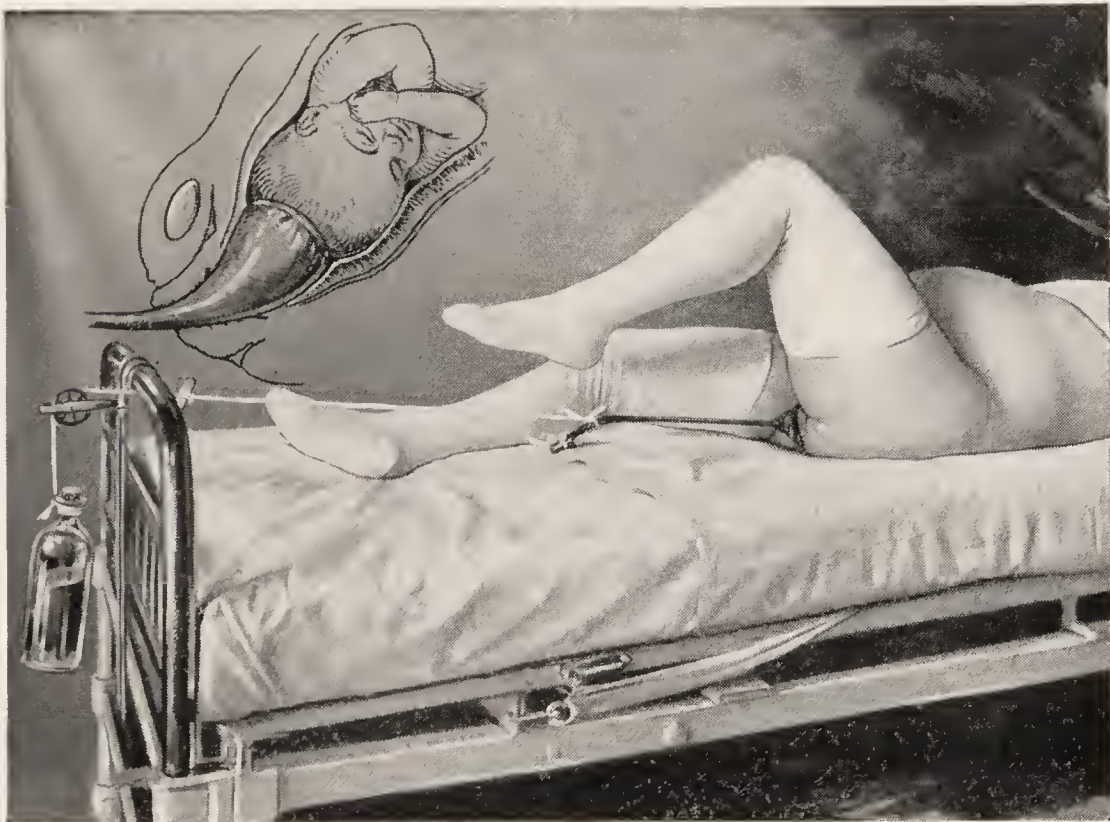


Fig. 169.—Treatment of placenta prævia with colpeurynter. Detail (above) shows how the bag compresses the placenta against uterine wall and stops hemorrhage.

of the open mouths of the vessels at the placental site; third, cesarean section; fourth, tamponade of the vagina or puncture of the membranes. The nurse's duties will vary with each of these methods. She will be most helpful in the case of version—watching the progress of the child, and the action of its heart, and in the case of the colpeurynter, where she may be required to keep sharp lookout for its expulsion and accurate record of the fetal

heart tones, since the bag may press on the cord. Sometimes the bag evokes tempestuous pains which might rupture the uterus, and the nurse will apprise the physician at once if she suspects this happening. *In both cases she must be prepared for operative delivery at any moment*, and for the treatment of hemorrhage and shock in the mother, and asphyxia of the baby. In all instances she notes the condition of the mother carefully and computes the amount of blood lost. Since the hemorrhage in placenta praevia cases is usually very profuse, the woman's very life depends upon the thoroughness of the preparation for all the complications which may arise (and there are many) and the promptness with which the emergencies are met.

Premature Detachment of the Placenta.—This means the dislocation of the placenta from its normal site. It is sometimes called *abruptio placentae*, meaning that the placenta is torn from its bed, or "accidental hemorrhage." It is a very rare and very fatal accident, 50 per cent of the mothers and nearly all the children being lost. It is due to injury, the patient falling against the corner of a table or being struck on the abdomen, or it may, more commonly result from toxemia, hemorrhagic diathesis, etc. The placenta is raised from its bed by a large hemorrhage, which may be "concealed," none escaping externally. These are the gravest cases. If the placenta happens to be near the os uteri the blood appears at once. These are called "frank" cases and are milder. Usually the hemorrhage is first concealed, and then external. The symptoms are those of an intra-abdominal crisis and hemorrhage—pallor, fainting, weak pulse, etc. The uterus enlarges, is of board-like rigidity, very painful, and the fetal heart sounds disappear.

The treatment is somewhat similiar to that of placenta praevia, but special emphasis is put on the preparations for shock—warmth, adrenalin, ephedrin, saline solution, a blood donor for transfusion, etc.

Extra=uterine pregnancy, or ectopic gestation, is a rare condition, though, since its recognition has become easier, it is found more frequently than in the olden time.

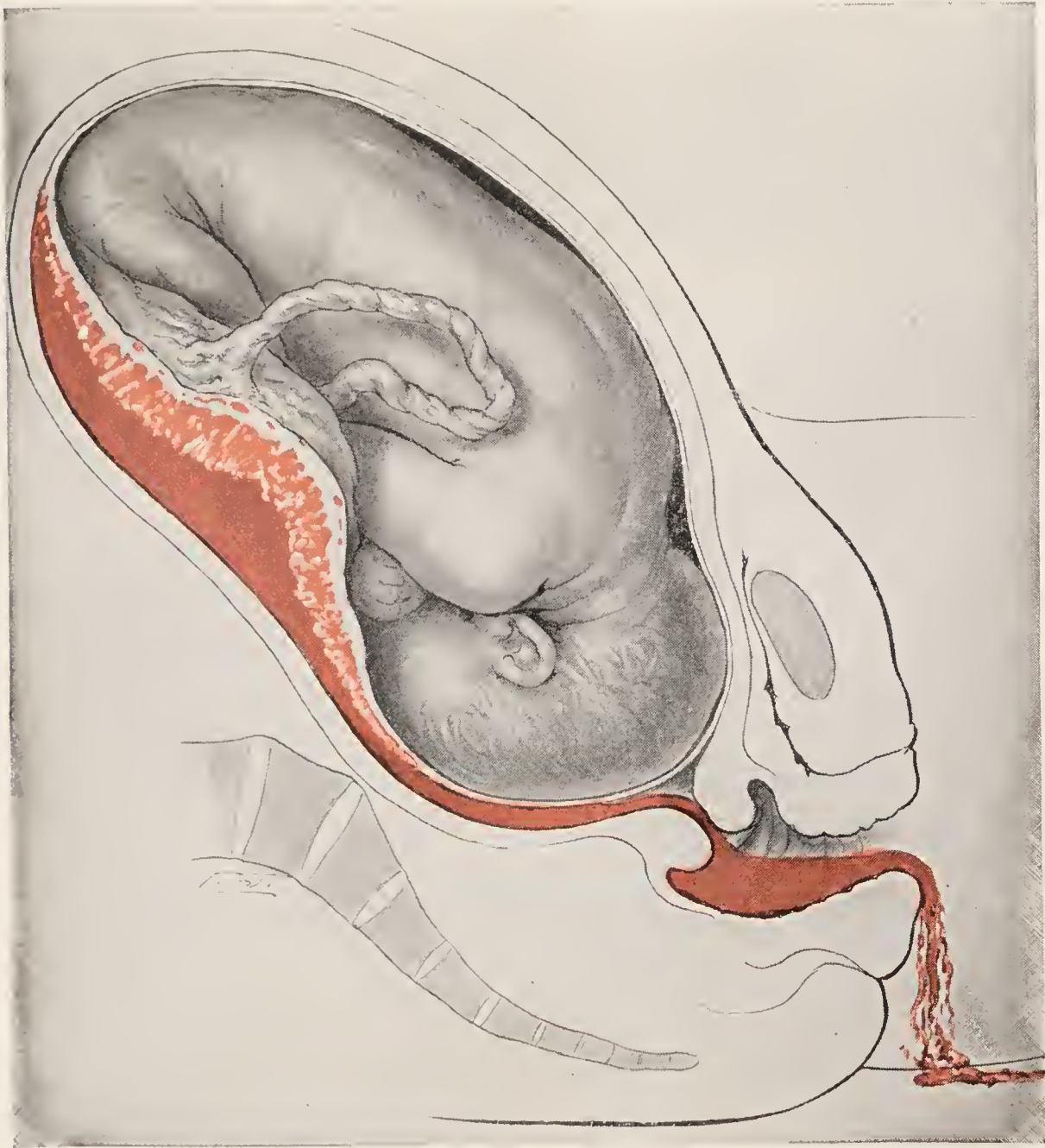


Fig. 170.—Abruptio placentae. Shows how placenta is detached, fetus dies, and external bleeding occurs.

It is the development of the pregnancy outside the uterine cavity. Normally the ovum passes down the fallopian tube into the cavity of the uterus, pursuing its further development there. If, however, it is arrested in the tube and grows here, an ectopic gestation of the tubal variety results.

The tubal is the common form of the anomaly, but the child may develop in the ovary or even in the abdomen.

Extra-uterine pregnancy is a serious condition, though in a few cases a spontaneous cure results. The accoucheur does not wait for this, but considers almost every case an indication for immediate operation.

In those cases where spontaneous cure occurs the ovum is either discharged from its bed and absorbed, or it may form for itself a new sac among the intestines and continue

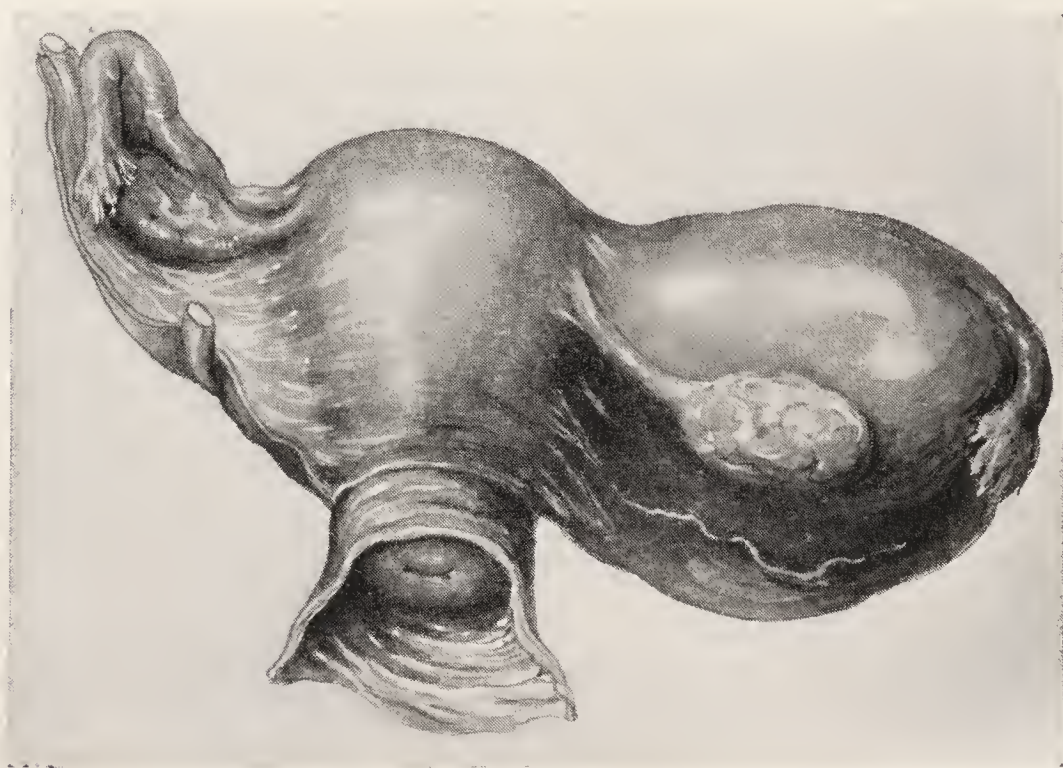


Fig. 171.—Extra-uterine (tubal) pregnancy, before rupture of the sac.

to grow until term, when labor comes on, without, of course, the delivery of the fetus. The child dies and either is changed into a hard, chalky mass, called a lithopedion, or stone-child, in which condition it may remain for years; or the whole ovum becomes infected and breaks down into pus and necrotic débris. The sac may ulcerate through the neighboring structures—the bladder, vagina, rectum, or abdominal wall—and the bones of the infant are discharged thus, one at a time. If the patient survives this long suppuration, after many months the whole mass is thus

gotten rid of. Most cases of ectopic gestation present alarming symptoms between the second and fourth months, due to rupture of the tube and intraperitoneal hemorrhage, which necessitates the accoucheur's interference.

As the ovum grows it distends the tube (Fig. 171). The fallopian tube has a thin wall, and, unlike the uterus, does not hypertrophy to accommodate the growing ovum. The tube, as the result of the distention, on the occasion of a sudden jar to the abdomen, a blow, straining at stool, etc.,

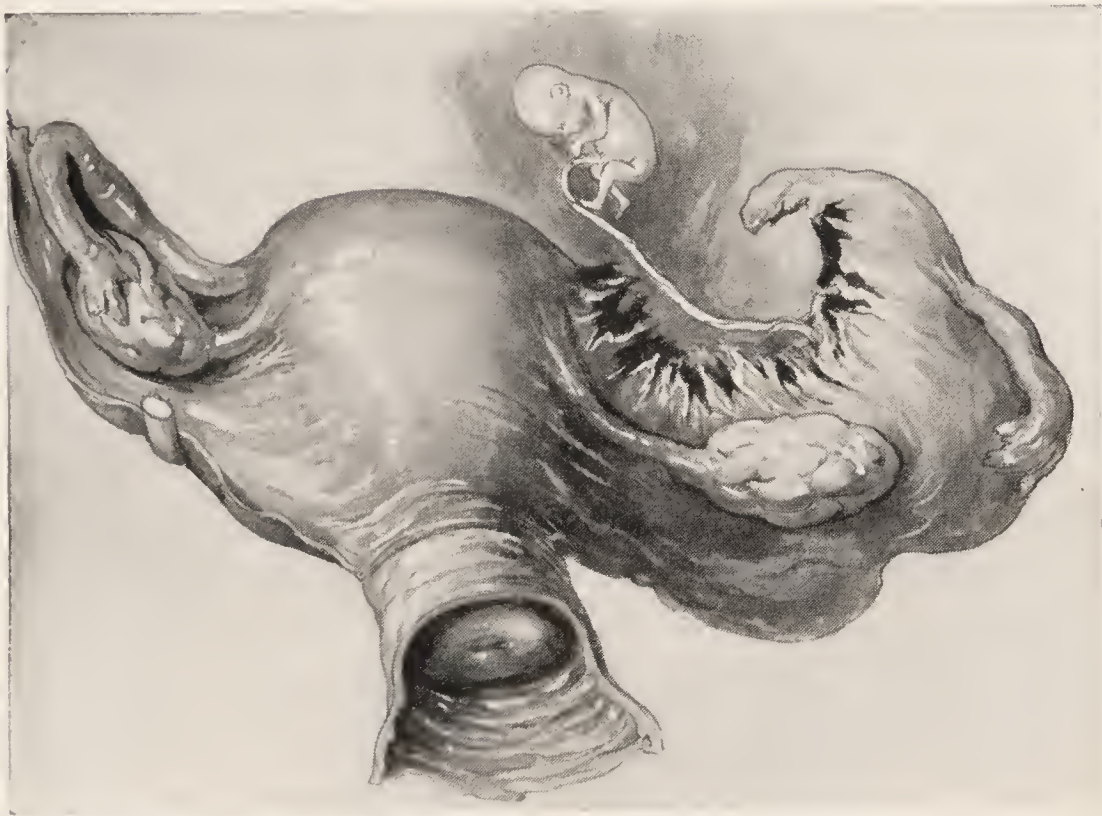


Fig. 172.—Extra-uterine (tubal) pregnancy, after rupture of the sac.

bursts (Fig.172). The ovum is wholly or partly expelled into the free peritoneal cavity, and more or less profuse hemorrhage takes place from the walls of the tube. This hemorrhage may be mild and the patient may then recover without treatment (rare), or the hemorrhage may be severe, and the most heroic measures must be instituted to save the woman's life.

The cause of ectopic gestation is usually found in the disease or congenital anomaly of the appendages. Chronic

tubal inflammation or pelvic peritonitis is usually found. The condition may occur twice.

Symptoms.—The patient has the symptoms of pregnancy, but menses, in small amount, may appear, and pieces of membrane may be discharged. In addition, there are usually pain and a sensation of fulness on the affected side. Should such symptoms come to the knowledge of the nurse, she should advise the patient to consult her doctor. The physician may discover a tumor alongside the uterus, which, taken in conjunction with the suspicion of pregnancy, usually leads to the diagnosis. The symptoms of rupture are very prominent, though not always easy to differentiate from those due to other conditions.

The patient complains of an agonizing pain, low down in the side, and this may last for an hour or more. Then the symptoms of internal hemorrhage and shock supervene—nausea, vomiting, anxiety, prostration, precordial oppression, pallor, pearly conjunctivae, rapid pulse, rapid breathing, and, if aid is not given, death in collapse.

If the first hemorrhage is not fatal, the patient may have another, or several. These are cases that require heroic treatment.

Duties of the Nurse.—If a nurse is placed in charge of a case of extra-uterine pregnancy before the rupture of the sac, her main solicitude will be to prevent the rupture. To accomplish this, she will not allow the patient to turn in bed without aid; will not permit straining during urination or defecation; and, in general, will keep the patient as free as possible from the slightest exertion. If the case is chronic and the fetus gone on to lithopedion formation, these rigorous rules need not be enforced, although the patient should observe more than ordinary care.

In preparing such a patient for operation, only the gentlest manipulation of the abdomen is permissible. Rough scrubbing might rupture the sac and precipitate a fatal hemorrhage. The nurse should acquaint herself with

the symptoms of rupture, so as to be able to inform the accoucheur at the earliest moment. She should also obtain from him concise instructions regarding what he wishes her to do in the emergency. As soon as the nurse takes charge of such a case, she should begin to prepare for the operation, which usually is not long delayed. In a quiet, unostentatious manner, the nurse may provide and sterilize all the utensils, linen, gauze, etc., necessary for abdominal section. Each night 5 gallons of water should be boiled and set away to cool. If not used, it is thrown away. Thus the nurse is prepared for all emergencies. Half the battle is already won by efficient preparation.

Should the nurse diagnose the bursting of the sac and the occurrence of intra-abdominal hemorrhage, she should elevate the foot of the bed, and apply a tight abdominal binder. The physician should at once be notified; if he is not within call, one of his close associates; or, failing these, the nearest doctor. While waiting for aid, the nurse prepares the room for operation (see p. 261), provides an abundance of sterile water, salt solution (0.7 per cent), sterile sheets, towels, pitchers, basins, etc. Laparotomy will usually have to be done, and a good nurse will have saved much time in getting ready for it beforehand. The preparations and instruments are the same as for cesarean section.

The after-care is that usual for laparotomies (see p. 296) plus extra effort to replace the blood the patient has lost. To accomplish this, saline solution and 5 per cent glucose solution are given by hypodermoclysis and by rectum. Nourishing foods and tonics are administered, general massage, fresh air, and the best hygienic measures are practised. (See Treatment of Hemorrhage, p. 382.) Nowadays these cases are treated in hospitals and at home only in emergency.

CHAPTER II

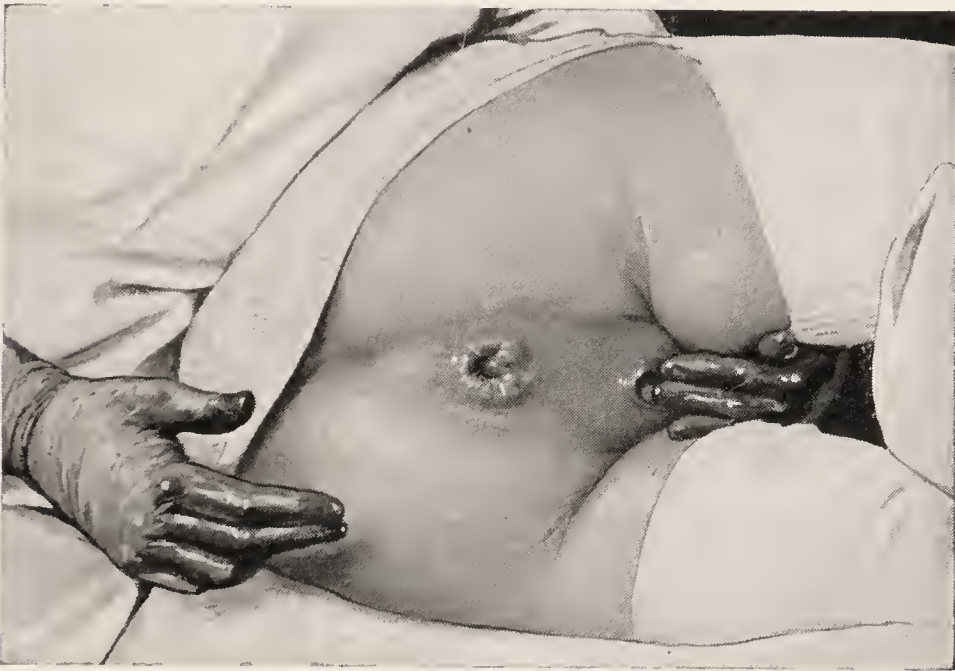
COMPLICATIONS DURING LABOR

THE most common complication which the nurse will meet is delivery of the child before the doctor comes. The physician is usually quite chagrined if the baby arrives before he does. How much the nurse may retard the delivery so as to await the doctor is an important question. If the patient is having strong pains, the nurse should keep her on her side and not allow her to bear down. The nurse should know the doctor's practice, what physicians usually assist him, and, if the accoucheur is not obtainable, should send for one of the men known to him, unless the family expresses other preference. It is not advisable for the nurse to assume the responsibility of the case alone. While generally there is no danger, it may be her lot to lose an infant, and thus she may be unfairly censured. It is not justifiable for the nurse to hold the head back forcibly until the doctor comes. She may hold it back so as to allow time for the perineum to stretch, as she has seen the doctor do, but more than this may injure the child or the mother. If she has to conduct the labor, let her observe the same rules regarding protection of the perineum as those practised by the physician:

1. Allow the head to come through slowly.
2. Keep the head well flexed and against the pubic arch.
3. Deliver the head between pains.

When the nurse finds she is alone with the case she should allay the fears of the family by telling them that the fact that the child is coming so quickly is proof that everything is right and the labor is normal.

She prepares the patient as usual for delivery, sterilizes her hands and puts on sterile gloves. A basin of solution with pledgets is nearby, and the nurse carefully catches any discharges from the rectum without soiling her fingers. She also swabs the parts generously with the antiseptic solution. Lysol, 1 per cent, is good, or 1:1500 bichlorid. As the perineum bulges and the scalp shows she gently



* Fig. 173.—Delivery of patient on the side. Nurse, with one hand between thighs, gently represses the head during the pains. The right hand is nearby to help hold the head back if the pain is too strong. The hands should not be soiled with rectal discharges.

restrains the head by pressure on it with fingers, not by pressure on the perineum. With each pain she allows the head to come down a little more. The patient should be admonished not to bear down too hard, and thus the nurse will allow the head to come through very slowly. After the perineum is stretched so that it seems as if the head may come through, in the interval between pains the patient is asked to bear down a little and the head will come. After

* In order to show the technic of protection of the perineum the delivery is made with the patient on her side. The manipulations are the same as if the parturient were on her back.

a few moments the pains force the shoulders out and then the trunk follows (Figs. 173–179). The nurse must not pull hard on the head to deliver the shoulders. Such traction may break the neck or cause Erb's paralysis of the arm.

When the head is born, the nurse wipes mucus from the head and eyes and from the nose and mouth, so that when the child gasps, nothing can be drawn into the lungs. After the child is born, the nurse places it a short distance from the mother, so that she cannot press it or the cord, and

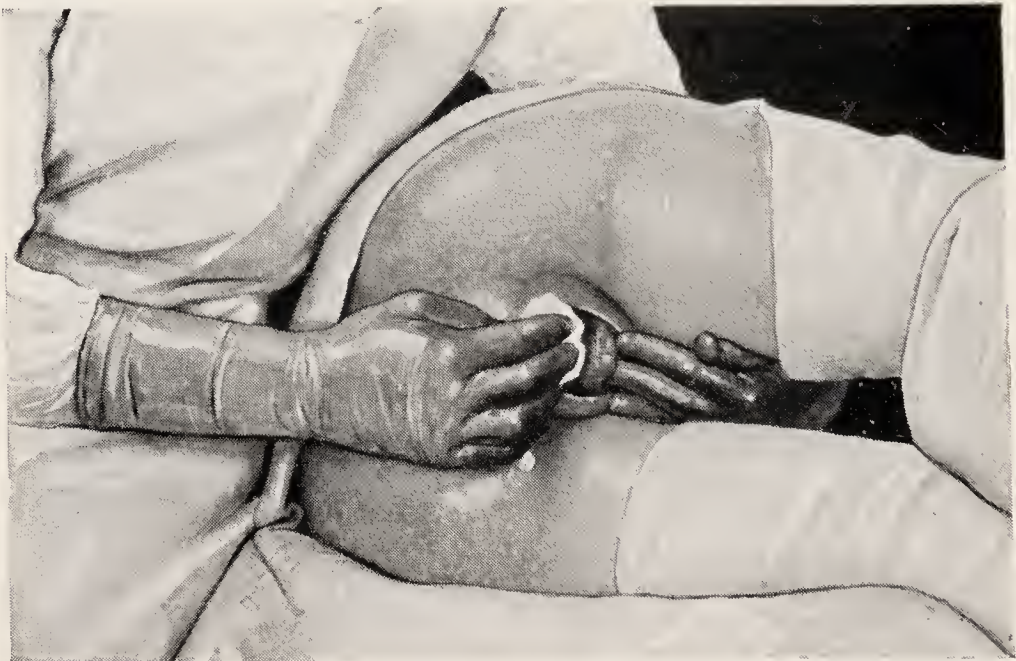


Fig. 174.—The two hands placed on the head (not on the perineum), with gentle force, evenly distributed hold the head back, allowing it to advance only a very little with each pain. The right hand holds a sponge with which the nurse bathes the vulva as the head recedes.

both patients are covered warmly. (See Fig. 74.) The nurse sits beside the patient, her hand resting on the uterus lightly, but not massaging it unless there is hemorrhage or the uterus balloons out under the hand. In this position she should wait for the arrival of the doctor. She must not tie and cut the cord unless the mother bleeds or unless the placenta comes. She may wait, in the absence of hemorrhage, as above indicated, an hour or more, without endangering the patient or the infant.

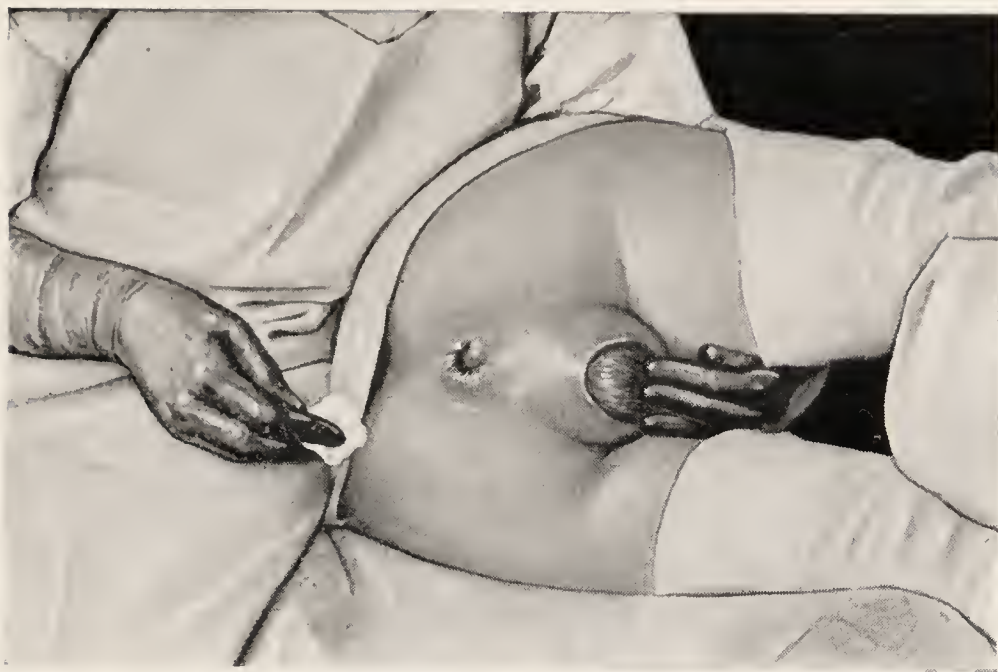


Fig. 175.—The nurse allows the head to come down during a pain, controlling its descent with the left hand. The right hand is about to be placed on the head as the perineum is getting quite distended, which is shown by the shiny appearance of the skin. The sponge is used to wipe a little mucus from the anus which is being forced open by the advancing head.



Fig. 176.—The head is about to escape from the vulva. The nurse pushes it upward against the pubic arch with the right hand, while the fingers of the left hand try to strip the anterior edges of the vulva back behind the occiput. The head is then allowed to roll up over the pubis, the perineum slipping over the child's face and under its chin.



Fig. 177.—The head is delivered. The nurse steadies it with the left hand, and wipes eyes, nostrils, and mouth with a sponge squeezed dry from an antiseptic solution.

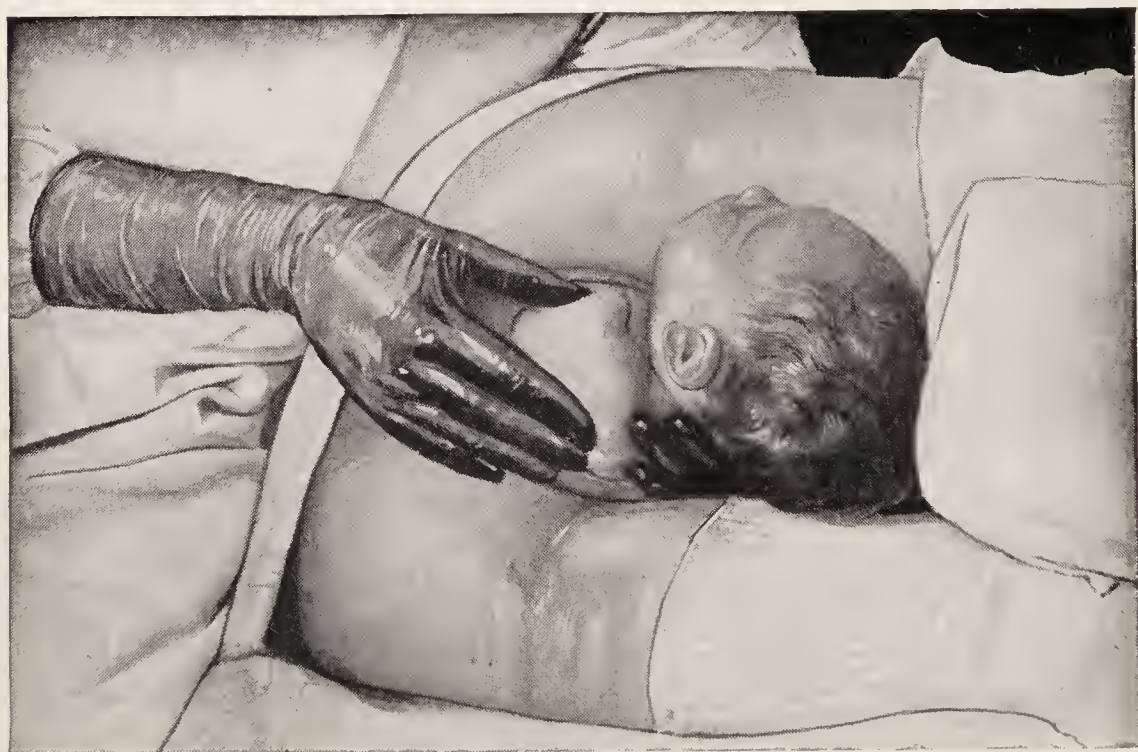


Fig. 178.—The shoulders are being delivered. The nurse holds the head with the left hand, and with the right she crowds the shoulder upward toward the pubis so as to avoid too much distention of the perineum by the trunk. Note how the occiput has rotated to the side, as it lay in the uterus. It is dangerous to pull on the baby's head—the neck may break or the arm be paralyzed.

Should it be desirable to separate the child, the nurse ties and cuts the cord as shown in Figs. 180 and 181, tying tightly and using sterile tape; then, after removing the infant, she folds a clean sheet under the patient and brings the limbs closely together. Then the nurse lays her hand



Fig. 179.—The child is delivered. With the right hand the nurse lays the child alongside the lower thigh of the mother, and steadies it while the mother is being turned on her back. This is done as follows: the right foot of the mother, the upper one, is removed from the pillow and placed on the edge of the bed just outside the baby's head. Then the left knee is grasped and raised in the air so that the patient's hips are brought to the middle of the bed, after which the foot is placed on the bed. The patient is now in position for the conduct of the third stage. (See Fig. 74.)

lightly on the uterus and awaits the spontaneous termination of the third stage.

Almost always the physician arrives at this time, and if he does not, the nurse pursues the safer course by insisting that another be called.

Should she be compelled by hemorrhage, either internal or external, to end the labor herself, she expresses the

placenta by gently squeezing the uterus at the height of an after-pain and pressing the placenta out at the same time.



Fig. 180.—Tying the umbilical cord. The cord is tied $\frac{1}{2}$ inch from the skin margin, using a surgeon's knot.



Fig. 181.—Cutting the umbilical cord. The cord is severed $\frac{1}{4}$ inch from the ligature. (This baby was delivered through a flat, contracted pelvis. Note the molding of its head.)

As the placenta appears she grasps it in the full hand, and with light, even traction draws the membranes after it. Neither haste nor excitement is necessary.

The nurse presents the placenta to the doctor for inspection, and requests him also to examine the perineum for lacerations. She should guard the uterus for thirty minutes after delivery of the placenta, and if it shows a tendency to relax, may administer a dram of ergot.

Should the case be a twin labor, the nurse will wait for nature to bring the second child. Assistance here is urgently indicated.

BREECH PRESENTATION

If the infant should come by the breech, the nurse's duties are more onerous. Fortunately, this accident is quite rare. As soon as the breech of the infant appears at the vulva, the nurse brings the woman across the bed with her hips a little over the edge, and the feet supported on chairs. As the child emerges she receives it in a warm towel with sterile hands. When the shoulders are to come through, the patient is exhorted to bear down, and the husband or a neighbor makes downward pressure on the uterus. When the arms are delivered the nurse inserts two fingers in the child's mouth, and, while the other hand is placed over the lower abdomen, makes gentle traction downward and out with the one, and pressure with the other so that the head comes upward and out. In this gentle fashion the head is delivered (see Fig. 110). Care is now taken to clear the throat of mucus and revive the child from the mild asphyxia which is not unusual. (See Asphyxia, p. 479). The rest of the labor is as above described.

PROLAPSE OF THE CORD

Once in about 400 cases the umbilical cord prolapses and appears at the vulva. This is a very serious accident for the child, since many times the infant is thus lost by compression of the cord and the resulting asphyxia. For the mother it is not dangerous unless operations are undertaken to save the child.

The nurse will easily recognize the cord when it appears at the vulva, and must send for the physician without an instant's delay. While waiting for him she places the patient in the knee-chest position (see Fig. 161), and, with sterile fingers, pushes the cord back into the vagina after



Fig. 182.—Prolapse of the cord. Shows how head compresses the cord and shuts off the circulation.

washing it with warm antiseptic solutions. The cord is retained in the vagina by a pledget of cotton, or the nurse holds the vulva together; under no condition should the cord be allowed to lie exposed outside. The patient quickly tires of the knee-chest position, and the nurse then allows

her to fall slowly on to two pillows on her side, in the elevated Sims' position (Fig. 183).



Fig. 183.—The elevated Sims' position.



Fig. 184.—The Trendelenburg posture in bed, using a chair to elevate the pelvis. In these positions the head falls away from the inlet and removes the pressure on the cord which endangered the baby's life.

Preparations for operation should now be made, as the physician, when he comes, will wish to make an attempt to save the child's life. He may order the Trendelenburg

posture for the patient, which the nurse obtains by putting a chair, inverted, in the bed, padding it with thin pillows, and arranging the patient on it as shown in Fig. 184. Usually patients complain of dyspnea and distress when kept in the knee-chest and Trendelenburg postures for any length of time, so that in such cases the elevated Sims' position is preferable, as it is more comfortable.

ACUTE DELIRIOUS MANIA

Some women cannot bear the least physical suffering and, as soon as labor begins, start shrieking with each pain. Toward the end of the second stage they may go into a frenzy, tear at the bedclothes, and strike or scratch the doctor or nurse. This is an evidence of acute mental disease and the poor woman should not be blamed for it. In bad cases the mind may be entirely gone for a while, during which time the baby may be born, and the woman, if alone, may lie on it or kill it, retaining later no remembrance of the occurrence. In legal actions of infanticide this fact is always considered.

The physician usually administers narcotics, but both he and the nurse can do much to at least mitigate this nervous paroxysm by psychotherapy, since in addition to the pain there is a strong element of fear in it. The nurse will encourage the woman in a sympathizing manner to bear her pains bravely, pointing out to her that by shrieking she wears down her strength, ruins her throat, and alarms her friends while actually delaying her labor. If the patient will, during the pain, breathe rapidly through the mouth she will get some relief. The nurse should close the windows and doors, out of consideration for the neighbors, and may arrange a towel so as to muffle the shrieks a little, but she is never permitted to restrain the patient with force, except from doing herself or her baby damage. In such cases the physician usually shortens the labor as much as is safe, to avert permanent impairment of the nervous system.

Various complications, described as occurring in pregnancy, may first appear during labor; such are eclampsia, placenta praevia, and detachment of the placenta.

HEMORRHAGE DURING LABOR

A woman may have an unusually bloody "show"; she may have a little hemorrhage at the completion of the dilatation due to slight tearing of the cervix when the head passes through it. As the head is being delivered not seldom there is bleeding from the tearing perineum or clitoris. Placenta praevia and detachment of the placenta sometimes occur during labor, and give rise to profuse and often dangerous bleeding.

Rupture of the Uterus.—The uterus may burst during pregnancy, but it is more frequent during labor, and the baby and placenta escape out among the intestines. The rupture may be spontaneous or traumatic, *i. e.*, the uterine contractions acting on a weakened portion, usually the lower uterine segment, may force the child through at this point, or the accoucheur may inadvertently thrust his hand or an instrument through the uterine wall. Fortunately this accident is very rare nowadays by the grace of good obstetrics. The causes of rupture of the uterus are two—weakness of its wall in one spot, as sometimes occurs after cesarean section and in placenta praevia; and obstructed labor, the way of the child being blocked by a contracted pelvis, or a tumor, or the infant itself presenting unfavorably, *e. g.*, shoulder presentation. The uterus ruptures as it fails to express the child; the woman goes into collapse from shock and internal hemorrhage, and the baby dies.

The nurse should know the symptoms of *threatening rupture of the uterus* so that she can apprise the physician in time. The pains are very strong and frequent and there is no advancement of the child, the patient bears down hard to no avail; she gets red in the face, very excited, com-

plaints of pain all the time, and is especially tender over the lower part of the uterus, which she instinctively supports with her hands, and she incessantly calls for relief. The uterus is hard on top, but soft above the pubis, and bulges out here, giving the appearance of a full bladder. (Catheterize if necessary to differentiate.) The round ligaments feel like two tense whipcords at the sides and are tender. When the nurse observes these symptoms she will form her own opinion that the progress of labor is obstructed and will send for help. In the meantime she prepares for operative delivery, which is usually performed at once in order to avert the fatal catastrophe of an *actual* rupture.

Postpartum Hemorrhage.—We designate all bleeding after the child is born postpartum hemorrhage, although, strictly speaking, the term should apply only after the placenta is delivered. The laity call such loss of blood a “flooding,” and truly the appellation is sometimes deserved. A large healthy woman may lose 500 to 1500 cc. of blood without being seriously imperiled, but a small anemic one may die from a loss of less than 400 cc.

Postpartum hemorrhage may arise either from a laceration of some part of the genital tract or from atony of the uterus. Further, the patient may have hemorrhagic diathesis, *i. e.*, be a bleeder. The laceration is usually made by an operative labor, as forceps or breech extraction, but it may occur, although seldom, in spontaneous delivery. Atony of the uterus is rare, and may be caused by general weakness of the mother, retention in the uterus of a piece of placenta or of clots, following overdistention of the uterus, disease of its structure, etc. The uterine muscle cannot contract well and close up the sinuses.

The symptoms of postpartum hemorrhage are those of external bleeding and the effects of the loss of blood on the patient. The nurse will observe a flow of blood from the vagina, sometimes steady, sometimes in gushes. Her

attention should be instantly arrested by a beef-juice-like, serosanguineous discharge. This is the serum exuding from large blood-clots which have accumulated in the uterus. The doctor should be informed of it.

The signs of acute anemia are: pale face and lips, cold sweat on the forehead, fast running pulse, rapid breathing, yawning; the patient complains of being dizzy or faint, has "clutching at the heart" (precordial anxiety), has ringing in the ears, and is sometimes blind. If the bleeding is not soon controlled the symptoms aggravate, the woman is restless, has cramps in the muscles, becomes unconscious, and dies. Happily, such extreme cases are rare, and with the exception of a woman whose blood is pathologically altered so that it will not clot, nearly all patients can be saved by the means we now have at our command. If the hemorrhage comes on before the placenta is out the doctor usually removes the latter; if the hemorrhage should come on after the placenta is out, the physician massages the uterus, gives pituitrin and ergot, a hot uterine douche, swabs the uterus with vinegar, packs it full of gauze, or adopts other means of controlling the loss of blood. The bleeding that occurs after the physician has left the house is what concerns the nurse in actual practice.

A woman in the first two hours after the placenta is delivered may lose 3 ounces of blood without there being any danger. If the uterus is hard and not too large, this is all right. If more than this amount oozes away; if there are clots; and if the loss keeps up, the physician should be notified. Should the patient be suddenly taken with a profuse hemorrhage, her life may depend upon rapid action of the nurse, and it is, therefore, highly essential that the latter retains her presence of mind.

The first thing to do is to grasp the uterus and massage it vigorously. The uterus may not be easily outlined, being only a big boggy mass in the lower abdomen. The nurse

kneads this until it contracts. The physician must be notified, and if he is too far away, the nearest one obtainable should be sent for. But the nurse cannot always wait for the doctor. She may administer a dram of ergot and give an ampule of pituitrin hypodermically. If her massage has the desired effect, the hemorrhage ceasing and the uterus remaining hard, this is all that is necessary; the nurse may wait, guarding the uterus. If not, the flow continuing, she at once gives a hot vaginal douche (120 F.), inserting the tube about 7 inches and giving the tube the upward and forward direction of the parturient canal. If this does not stop the hemorrhage, the nurse should pack the vagina as tightly as possible with gauze, cotton, handkerchiefs, or anything at hand that is sterile. After the vagina is tightly packed the nurse places her fist against the packing at the vulva, and with the other hand presses the uterus down against the pelvis (Fig. 185).

If her arm is not strong enough to keep up firm pressure, the husband will have to help. In this way the hemorrhage can be controlled, or at least mitigated, until the doctor comes. Throughout the nurse must keep her presence of mind, must act coolly and confidently, and not neglect her antiseptic precautions.

While doing these things, the nurse has the foot of the bed raised 3 feet from the floor by means of a table; when the bleeding is controlled she gives the patient some strong hot coffee, or a hypodermic of strychnin, $\frac{1}{40}$ grain, if necessary.

While the doctor is coming she has the husband, under her direction, provide towels, hot water, etc., for eventual operation. Fortunately, the nurse is rarely called on to assume such grave responsibilities. The writer knows of only three instances, and here massage with a dose of ergot and one of pituitrin accomplished all that was necessary.

The nurse's duties while assisting the physician at a case

of postpartum hemorrhage are many. She must see that the patient is not exposed to chilling, that she is kept warm by hot-water bottles, that there is an abundance of hot and cold sterile water for douches, hypodermoclysis, and hand solutions. The physician may wish to tampon the uterus, and for this will need a jar of sterile or antiseptic gauze. (See p. 558 for description of method of preparing the gauze and p. 308 for description of operation.)



Fig. 185.—Treatment of postpartum hemorrhage, with bed elevated.

When a hot douche is ordered, the nurse should ask the degree wanted, and often the fluid has a temperature of 115 to 120 F. Sterile water or 1 per cent lysol solution is usually ordered. The nurse should be skilful in giving hypodermic injections, and should never be found with a defective syringe.

When the bed is ordered elevated, a table at least 30

inches high is to be placed under the foot; a box on the table adds to the elevation (Fig. 185). In hospitals the aorta compressor invented by Sehrt may be used (Fig. 186). Sometimes the patient's limbs are tightly bandaged to keep the blood near the heart, giving it sufficient to pump on until transfusion can be done.



Fig. 186.—The Sehrt aorta compressor applied: A, Enlarged detail.

If the case is so serious as to demand salt solution transfusion, the nurse prepares for same. (See p. 313 for details.) Should the patient faint or feel like it, smelling salts may be applied to the nostrils and a stimulant hypodermic injection be given. The physician may order ether, whisky, caffeine-sodium-benzoate or aromatic spirits of ammonia to be given hypodermically. Warmth is our best remedy in shock. Cases like this impress upon the laity the importance of skilful and sufficient attendants, even for a normal labor. Throughout the labor the nurse should bear in mind

the possibility of postpartum hemorrhage and should exercise all her nursing skill to forestall it. We know that exhaustion, mental as well as physical, predisposes to relaxation of the uterus, and the nurse may do much in the first stage, by securing rest for her patient, by teaching her how to preserve her forces, by keeping up her strength with food and liquids, and by fortifying her courage with her own spirit and confidence. The preparations against hemorrhage have already been mentioned (p. 163).

After-care.—This is highly important. It requires much care to nurse the exsanguinated woman back to health. The bed should be left raised until the physician orders it lowered, which may be from one to four days. When lowering is ordered, the nurse lets it down a foot every hour until it is horizontal. Fainting may result if it is lowered suddenly.

The diet is carefully regulated. Liquids in abundance, short of causing emesis, are given. Rectal injections of saline solution may be ordered. (See p. 399.) When food is acceptable, milk, eggs, meat-juice, and, later, liver, steak, the marrow of bone, and vegetables rich in blood salts (as spinach and lettuce) are given. The physician may order a blood tonic and a trip to the seashore to complete the recovery. While the patient is in bed she must not raise her head until the nurse deems it safe. This is to prevent fainting. She may move in bed during the first few days only with great deliberation, this precaution being intended to prevent heart embolism. When the nurse gives such a patient a bath she should not rub the limbs too vigorously, as clots sometimes form in the large veins and hard friction might loosen them. They would then float in the blood-stream to the heart or lungs, perhaps causing fatal embolism. The bed exercises should begin early, but be given gently.

Many complications besides these discussed can occur during labor, but it is possible only to mention some of

them here. Heart disease, pulmonary tuberculosis, acute and chronic, pneumonia, typhoid, appendicitis, obstruction of the bowels, pyelitis, infection (septic, gonorrheal), all these give the nurse special problems to think about and extra duties to perform. Since the limits of this book forbid it, the nurse must consult her library of surgical and medical works and combine her surgical and medical knowledge of nursing with her obstetric, in order to give her patient all the benefits of her art.

CHAPTER III

COMPLICATIONS OF THE PUERPERIUM

Nothing gratifies the physician more than to have the patient and her babe make a rapid and uncomplicated recovery from the confinement. If a puerperal woman takes ill, the whole house is thrown into gloom, and if the child should sicken, the mother becomes at once nervous and restless, fearing her new joy is to be taken away. A death during confinement or after seems much worse than at any other time, and, truly, no woman ought to lose her life under these painful, interesting, and sympathetic circumstances. The greatest danger to the puerperal woman is

PUERPERAL INFECTION

Puerperal infection may be defined as a disease, febrile in nature, but sometimes non-febrile, resulting from infection of the genital tract at any point of its extent. A woman after labor can have fever from many causes, as sore throat, typhoid, intestinal and urinary disease, but when the symptoms point to an infection of the parturient canal in any portion of its length, she is suffering from puerperal infection. In olden time there was very prevalent an acute febrile disease afflicting puerperae, and more or less epidemic, which was called puerperal fever. This was often fatal, and usually very severe, and with definite characteristics, so that it came to be considered a specific fever which affected only lying-in women, and was to be classed by itself, like typhus and other special diseases. Now it is generally recognized that puerperal fever is nothing more nor less than septicemia, similar to sepsis after surgical operations. The term "puerperal fever" is still

occasionally applied to the severer forms of puerperal infection, but it is best to drop the term entirely, or make it synonymous with puerperal infection.

Puerperal infection (or fever), then, is nothing more nor less than infection of the genital tract, and, like all infections may be mild or severe, local or general, and of many varieties; like other infections, too, it may be prevented.

The history of puerperal fever is interesting. It was known and written of a thousand years before Christ. In the *Ayur Veda* of Susruta it is mentioned, and the father of medicine, Hippocrates, who lived 400 B. C. writes of it, saying there was an epidemic and "the daughter of Teleboulos died of it on the sixth day." It prevailed all through the ages, and when hospitals were started it broke out with greater fury. In the Paris Hôtel Dieu in 1664 it killed 10 per cent of the women confined. In 1823 it carried off 19 per cent—nearly 1 in 5—of the women confined in the Vienna Maternity.

The cause of the disease was unknown. It was ascribed to a stoppage of the lochial flow, to a turning inward of the milk, to catching cold, to atmospheric conditions, etc. In the early part of the last century Denman, of England, taught that it could be carried from one patient to another by the doctor or midwife, and that the doctor could carry it from his erysipelas and suppurating cases.

The credit for having recognized the cause of puerperal infection and forcing the knowledge of it on the medical profession belongs to Semmelweis (Fig. 187), of Budapest, Hungary. Semmelweis, then a young intern in the Obstetric Clinic of the General Hospital of Vienna, in 1846 noticed that the midwives' clinic adjoining had a low mortality—about 1.5 per cent—while the clinics where students were taught and he practised had 15 per cent. This galled him, as his was a conscientious nature. The difference between the clinics was so marked that the servants had quarrels over the conditions, and the mid-

wives did not fail to taunt the medical assistants with the facts; even the city authorities noticed them.

Semmelweis worked hard and long to find the solution of the trouble, and did not succeed until a sad accident showed it to him. His friend, Kolletschka, infected his finger at a postmortem and died of sepsis. Semmelweis saw the autopsy of his friend, and was struck with the similarity of

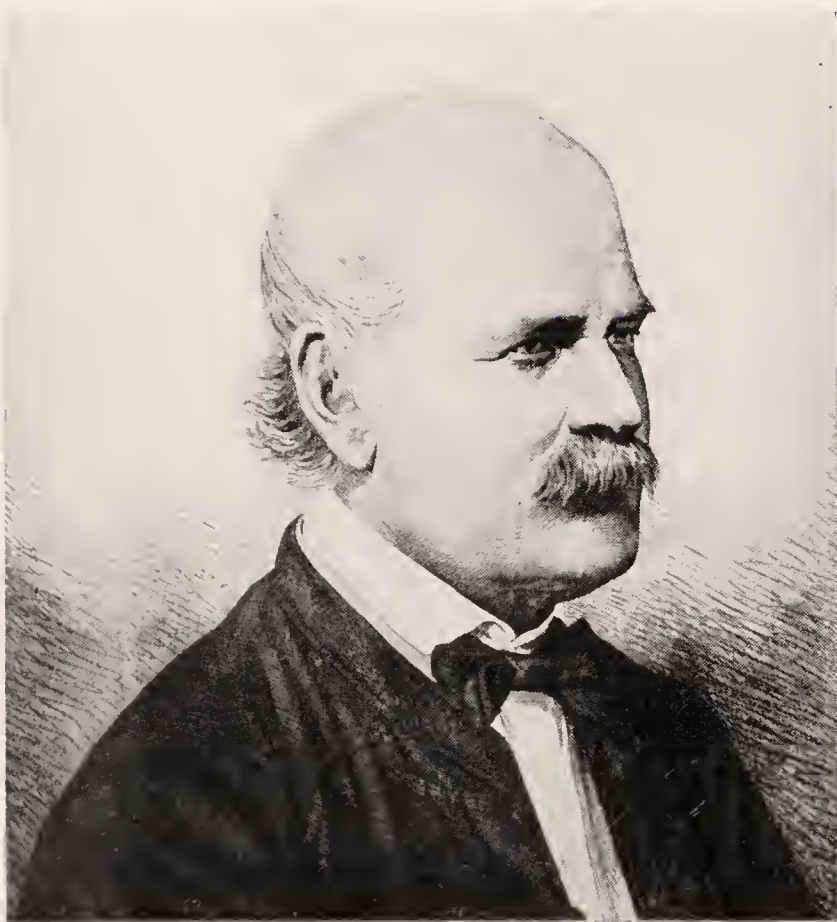


Fig. 187.—Ignaz Philipp Semmelweis, the discoverer of the cause, and the inventor of the means for the prevention, of childbed fever, or puerperal infection. Born 1818, died 1865.

the postmortem findings to his own findings in the puerperal fever cases. Eureka!

Semmelweis now argued that the cadaveric poisons were carried on the hands of the students and physicians to the lying-in women. It was a fact. The students would go directly from the morgue to the confinement room. It is a wonder that any women escaped.

Semmelweis immediately ordered the students and assistants to clean their finger-nails (a novel procedure in those days) and to wash their hands with chlorin water—the best deodorant they possessed at that time—and the results were striking. The mortality in his clinic sank below that of the midwives' clinic. Soon Semmelweis learned that there were other causes of puerperal infection.

In the confinement room were 13 beds. A woman in bed No. 1 had a gangrenous cancer of the cervix; 12 other patients in the confinement room were examined by the doctors who had examined the first. Eleven of the 12 women died of childbed fever!

Thus he developed his theory as it is held and accepted today, that puerperal fever is caused by the introduction into the genitals, from without, of septic material.

Oliver Wendell Holmes, of Boston, had tried before this to prove to the medical profession that puerperal fever was a "private pestilence," and that the doctor could and did carry it about, but his teaching, being very vague, was not fully accepted, nor was that of Semmelweis, either here or abroad, until Pasteur, Koch, and others developed the science of bacteriology.

To Semmelweis, therefore, belongs the undying credit of having proved the cause of this fearsome scourge and having pointed out the manner of its prevention, and his name must be mentioned with that of Jenner and other great savers of human life. The slowness of the medical world in accepting his theory and his constant effort to force it to do so drove him crazy. He died in an insane hospital, and, fatefully enough, just as did his friend Kolletschka, from an infected wound acquired at an autopsy.

Frequency and Source.—It is sad to have to say that thousands of women are sacrificed every year to this dread disease. That 6000 women die from it in the United

States every year is a very conservative estimate. In the maternities a case of sepsis is rare, and a fatality from infection is almost unknown, but in private practice the disease is still frequently met with, although in a milder form than in the olden time. The number of women dating permanent invalidism from a mild infection during childbirth is legion. More women die and are wounded in confinement every year than men die and are wounded on the field of battle. It has been well said that the confinement room is the woman's battlefield.

The bacteria which cause puerperal infection are the same that cause other infections—the *Streptococcus pyogenes*, the *Staphylococcus aureus* and *albus*, the *Bacterium coli*, and the gonococcus being most commonly found, usually associated with micro-organisms of decomposition. The most fatal diseases are due to the *Streptococcus* and *Staphylococcus aureus*.

Where do the germs come from? From a case of puerperal infection; infected abortions; from the lochia of puerperal women (not necessarily with fever); from a menstruating woman; from *any suppurating surface*—for example, ulcers, abscesses, phlegmon, running ear, ozena; from erysipelas, scarlet fever, and diphtheria cases; from the dirt under the finger-nails—in short, anything that is not absolutely sterile will, if introduced into the genital tract, cause infection.

It is certain that the vagina of even a normal, healthy pregnant woman contains bacteria, and these are sometimes virulent; and it is true that under certain circumstances these germs may enter the system and cause disease. We call this auto-infection. Nature protects the woman from infection by the following means: First, the patient has a natural immunity against infection; she can overcome a certain amount, and this varies much in different women and in the same woman at different times. The writer believes that the woman brought up and living in squalor

can stand infection better than the delicately bred woman. What the nature of this immunity is we do not know. We, therefore, do not trust to such uncertain protection in treating our obstetric cases. Second, the vagina has bactericidal power. Third, the germs are not carried upward in a normal labor, but down and out, the liquor amnii and the blood helping to wash them out. The great danger is in the doctor or the nurse carrying them up into the uterus, and this is an important fact to know. As long as the doctor and the nurse do not carry bacteria into the genitalia, and do not spread upward any contamination which happens to be on the vulva, the woman is practically safe from infection.

The Prevention of Puerperal Infection.—Nowhere is the saying truer than here that an ounce of prevention is worth a pound of cure. As yet we know no certain cure for infection that has once obtained a foothold in the genitals, but we can almost absolutely prevent the introduction of alien bacteria. In the rarest instances the patient herself is responsible for her illness (we call it auto-infection), but the rule is that the patient, should she present any form of sepsis, has been infected from the outside.

The carrier of this infection to the genital tract may be the *doctor*, the *nurse*, the *patient* herself (she may have a septic focus somewhere—tonsils, sinuses, etc.), the *husband* (he may have a septic urethritis), or *someone else*, and these facts indicate how extensive must be our efforts to preserve the parturient from danger.

For the doctor, there are two grand principles for the prevention of infection: first, to reduce to a minimum the necessary injuries (tears, bruises, etc.) of labor; second, to see that nothing infected comes in contact with the genital tract. The doctor, therefore, will not interfere unnecessarily in the conduct of the labor, will not examine too much, but, in short, will allow as natural a course of labor as possible.

The Asepsis of the Nurse.—A nurse will not go from an infected case to a labor. A full week should elapse, during which time she should bathe and shampoo her hair frequently. She should take care of her person, have her teeth sound, and attend to any possible catarrh.

The hands require special care. The arts of the manicure are not to be despised, which advice may well apply to physicians. Constant scrubbing and the use of strong antiseptics ruin the skin, therefore rubber gloves should be used wherever possible. A smooth skin is easily cleansed; a rough one, not. Rings are never to be worn while in attendance on a confinement case.

The nurse wears a freshly laundered uniform in the confinement room, and does not go on the street with it. This is neither asepsis nor good taste.

A needed warning to the nurse is never to relax the stringency of her aseptic precautions. It is so easy to grow careless and desultory. But a day of reckoning will surely come, and if a nurse feels she is responsible for some dear mother's death her remorse will be unassuageable.

The nurse's duties during the labor are to provide the sterile basins, solutions, pledgets, towels, etc., *just the same as for a laparotomy*. Her hands should be as sterile as possible throughout the labor, but she may not touch aseptic things or the patient until she has taken time thoroughly to sterilize her hands. She must not insert her fingers in the patient's genitals without express orders from the physician. A long forceps with which to hand things to the doctor is very convenient. When not in use, these forceps may be kept in a tall jar (an olive bottle, for example) of 1 per cent lysol solution. These forceps are a necessary part of the nurse's outfit.

During the puerperium the hands must be disinfected each time the genitals are dressed. The nurse should arrange everything needed near the bed, and then sterilize her hands for the dressing. Gloves are used by many nurses

with much satisfaction. Others use the sterile dressing forceps. The vigilance against infection should last throughout the puerperium.

The same care must be exercised in the dressing of the umbilicus of the infant. Many children die every year from infection of the navel, and this is preventable. The eyes of the infant, too, may be infected by the fingers of the nurse.

Of great importance is the asepsis of the breasts. The nurse may carry infection to them from the lochia or other source, and cause mastitis and abscess. As it is impracticable, though desirable, to sterilize the hands each time the baby is put to the breast, the nurse must take care that the fingers do not come in contact with the nipple. If this is necessary, the hands must be clean. These aseptic precautions must be doubled if there is a crack, fissure, or blister on the nipple. The use of sterilized cotton applicators for washing the nipple is to be highly recommended. Altogether, the contact of the fingers with the puerpera is to be systematically avoided and sterile things substituted, as gloves, applicators, etc.

A woman who escapes a mastitis for two months will almost surely be able to finish nursing without trouble. Thus the chief duty of the nurse during the puerperium is to fight germs at all the points where they attack the mother and babe, and success will attend only conscientious and continuous efforts.

Symptoms.—The symptoms of puerperal infection are very varied. Usually a severe attack is evidenced by malaise, a chill, fever, rapid pulse, and all the symptoms that accompany a febrile disease. Locally there are usually pain around the uterus, altered, not necessarily foul-smelling, lochia, sometimes cessation of the same; the little wounds around the vulva take on an unhealthy aspect, and in some cases signs of peritonitis develop while in others abscesses form.

The cases are of all degrees of severity, and their courses are irregular, except when the infection is severe. Here a peritonitis almost always carries the patient off in a few days. It is impossible to go further into this subject here, because it is a very large one.

Every puerperal woman that has fever is not necessarily septic, but sepsis is the *first thing* to be thought of, and we shut out other causes—sore throat, mastitis, constipation and the essential fevers like typhoid—before coming to a positive diagnosis of puerperal infection. That a woman may have fever from the bowels is possible, but simple constipation does not cause it. Sometimes a sharp rise of temperature subsides completely and finally when the bowels are thoroughly evacuated. One must be very careful not to call a fever in the puerperium intestinal in origin without careful examination and mature deliberation.

Treatment of Puerperal Infection.—In this disease as much may be expected from good nursing as from medical and surgical treatment. Every effort is made to develop the patient's resisting powers, to strengthen her so that she can throw off the disease. For this, her surroundings should be the best obtainable; the outdoor treatment of such cases has been tried with success; at all events, a bright, sunny room, well ventilated and free from noises, should be selected; household worries should be kept from her, and the family should be admonished to be cheerful and not show the patient signs of anxiety. Visitors should not be allowed until convalescence is well established.

The skin excretes poisons, and the nurse will, therefore, see that this function is not interfered with. A daily sponge-bath with water containing a little eau de Cologne or Florida water and a soap-and water bath every third day are sufficient. Sometimes the quartz lamp is used.

If the patient has a chill, the nurse surrounds her with hot-water bottles, gives her a hot drink, and covers her up warmly. When a sweat comes on, the nurse sees that the

puerpera does not take cold, by rubbing the body with a little warm water and alcohol. If the course of the disease is prolonged, the nurse will institute proper treatment to prevent bed-sores, as gentle washing with weak alcohol, followed by a little oil, the use of salves, making a ring of adhesive plaster with carded wool in the center, the use of a felt cushion, of the air-cushion, frequent change of position, etc. One of the best means to prevent bed-sores, as well as to preserve the strength of the patient, is the use of an invalid bed. The patient is elevated on this for the attentions to the genitals, bowel movements, etc., and also to relieve the sacrum from continuous pressure. In the absence of an invalid bed, the symphysiotomy frame (see Fig. 138) does equally good service.

The dressings of the vulva need be frequent, as the discharges are irritating, sometimes even corrosive. Antiseptics should not be too strong. The physician's advice should be sought here.

The bowels will need attention. If there is diarrhea, the physician will usually prescribe something; if constipation, the nurse will probably be instructed to give enemata. The nurse should call the physician's attention to the state of the intestinal canal and the character of the evacuations. If there is much tympany the physician may order turpentine stupes to the abdomen, and the nurse sees that they do not blister. He may also order carminative enemata or the rectal tube. For abdominal symptoms of peritonitis, ice or hot applications may be applied to the belly; there should be only one layer of cloth between an ice-bag and the skin.

In the vomiting of peritonitis both doctor and nurse stand powerless and distressed. Gastric lavage helps only for a short time.

Should the patient become delirious the nurse must watch her, not leaving her alone a minute, as she may jump out of the window or destroy her infant. An acute

mania may develop in these cases. Septic patients are often placed in the White position, that is, a half-sitting posture, to favor uterine drainage. For this purpose a back-rest is used, or the head of the bed is raised.

Nourishment.—If the nurse will bear in mind these three facts regarding a fever patient she will appreciate how important are her duties regarding the diet. First, the metabolism is very much more active, that is, the chemical tissue changes are much accelerated by the fever and the patient burns up her tissues rapidly, first the glycogen of the liver, then the fats and vital organs, heart, liver, kidneys, muscles, etc. Second, the blood is concentrated and the patient much dehydrated, which the nurse will find very obvious from the parched tongue, the hot dry skin, the small amount of highly colored urine. Third, the system is flooded with toxins from the source of the infection.

Now the nurse must combat these three conditions. First, she must supply the body with sufficient food calories to burn so that the patient will not burn up her own tissues too fast—3000 calories daily if possible. Second, she will relieve the dehydration of the body by administering water freely in every possible way, and third, she will try to help the patient eliminate the toxins by supplying liquids to dilute the poison in the blood and stimulate the excretories, by proper digestible food and by keeping the skin healthy, the bowels open, and the lungs provided with plenty of fresh air.

After the first few days, when liquid diet is usually ordered, the patient should be given semisolid food frequently, every three hours, in small amounts. Dr. Graves said you should “feed a fever.” Lactose contains many calories and may be freely used to supply “fuel” instead of cane-sugar, which may cloy the appetite. Glucose may be given intravenously—it saves the glycogen in the liver. The patient may have almost everything a healthy woman would eat, but in small amounts, plainly and

perfectly cooked, and most daintily and appetizingly served. The soda-fountain drinks are permissible, also pure fruit syrups with plain or carbonated water, and grape

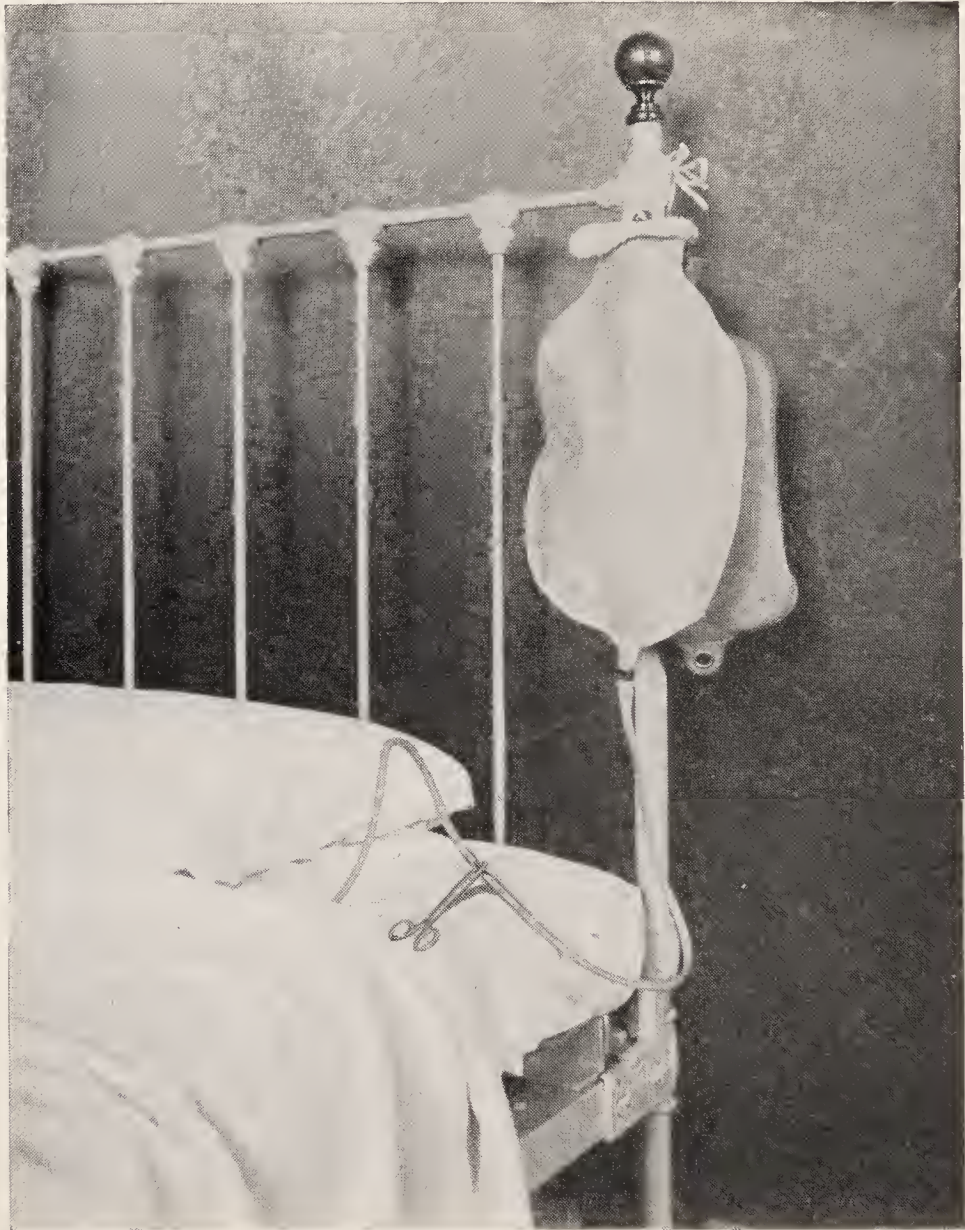


Fig. 188.—Continuous administration of saline solution per rectum. The douche-bag is wrapped with the hot-water bag in a large towel and another hot-water bag laid over the tube near the patient to maintain the heat of the solution during the long administration. The artery forceps regulates the flow.

juice, if it agrees. A well-mixed diet, containing fresh leafy vegetables, fruits of all kinds (except raw bananas), simple meats, a moderate amount of butter fat, but an increase of carbohydrates (sugar, starches, bread-stuffs,

etc.), should be the special study of the nurse, and if she can provide 3000 calories daily, and keep the patient's digestion and assimilation good she will enjoy the satisfaction of having contributed the major part to her charge's recovery.

Rectal infusion of saline solution by the drop method is much used in the treatment of puerperal sepsis (Fig. 188); 2 teaspoonfuls of common salt in 1 quart of warm water give the right proportion. The douche-bag is hung on the bed-post with a hot-water bag alongside, both wrapped in a towel. The hot-water bag keeps the saline solution warm. The douche-bag tube is connected with a small catheter, and by means of a pair of artery forceps the tube is clamped so as to allow the solution to drip from the catheter about 1 drop each second. This is called the "drop method." The catheter is then placed in the rectum. Sometimes the salt water is absorbed as fast as it flows in; again, the patient cannot retain it long. Usually the patient has to be placed on a bed-pan, which is very uncomfortable unless a rubber utensil is at hand. Instead of the douche-bag a vacuum bottle may be used, arranged as in Fig. 190, or an electric light may be immersed in the solution, and a hot-water bag may be laid over the tube in its course.

The salt water stimulates the lymphatics of the pelvis and helps to wash the poisons out of the system.

Medicinal Treatment.—Unfortunately, we possess no medicine that is a specific for infections. Antistreptococcic serum, vaccines, Credè's ointment, and other remedies may

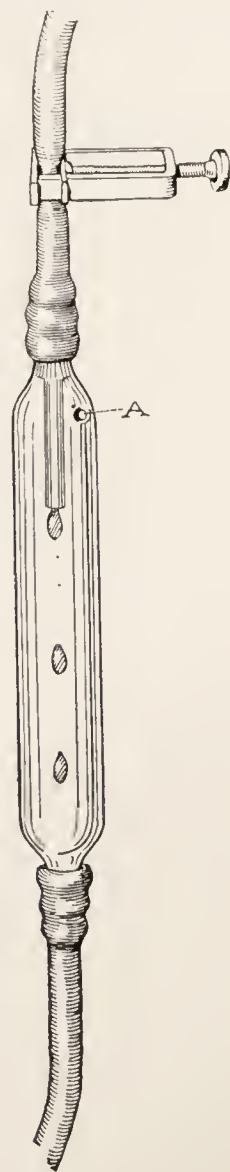


Fig. 189.—Glass gauge to show the rate of dripping of the saline solution. This is fastened in the length of the tube.

be exhibited by the physician. At one time alcohol was considered a specific and was much used in the form of large doses of whisky or brandy, but nowadays only a little

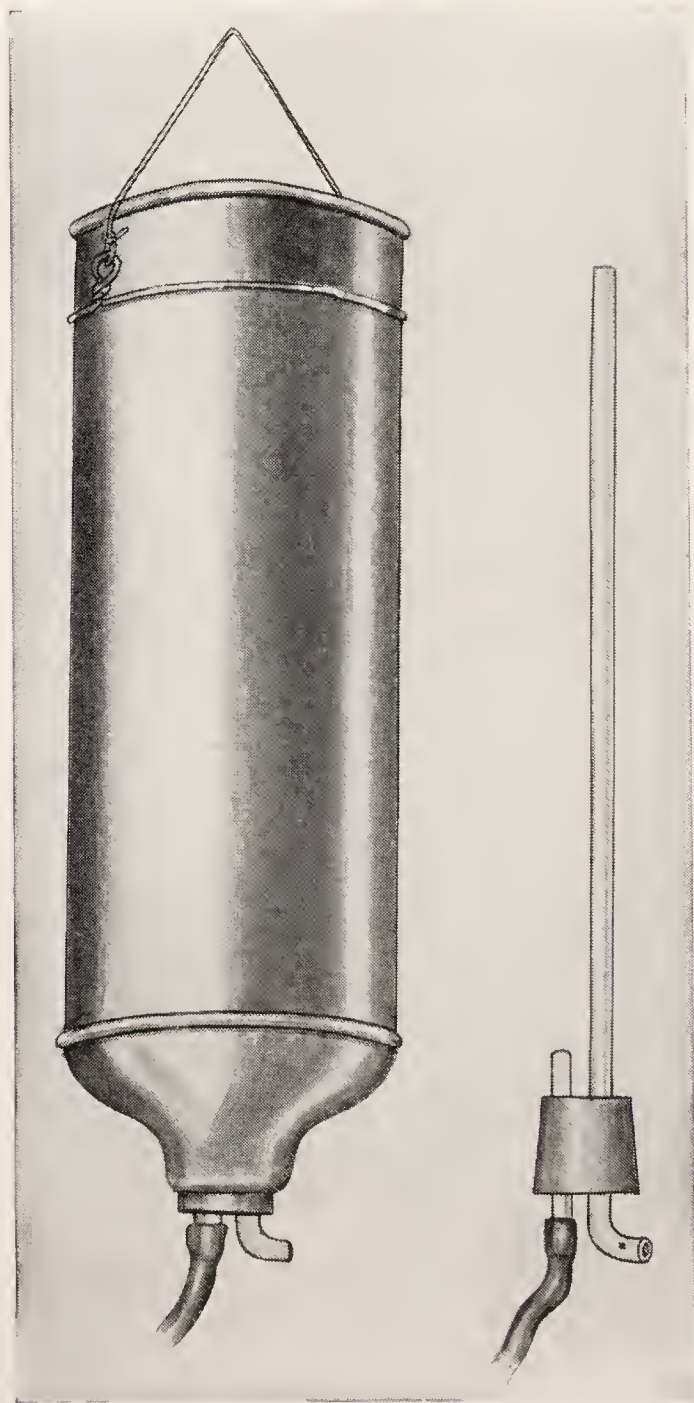


Fig. 190.—Vacuum bottle used as irrigator. The cork shown at the side carries two glass pipes, the rubber tube being attached to the shorter one.

light wine is given, and this to aid the appetite. The fever is best treated by cool sponging. Ice-packs are too depressing, and the cold bath involves too much disturbance

of the patient. Sometimes a warm pack reduces the temperature better.

Mental Treatment.—The nurse may help a great deal toward the ultimate recovery of her charge by properly nursing her mind. The rôle of the mind in chronic diseases is well understood and its influence demonstrated beyond question. No less in acute affections does the mental reaction of the patient to her disease work for good or ill. The nurse will study each woman carefully and will try to find the best way to keep her mind free from worries of all kinds. The nurse will hold always a cheerful, buoyant spirit—never one of levity, and unobtrusively but in countless ways will suggest the idea of recovery to her. This is especially necessary in chronic cases, and sometimes the disease lasts several months, wearing down the patience and taxing the ingenuity of all the attendants. Even when the outlook is the gloomiest no one should lose hope because sometimes remarkable changes may take place, and, without doubt, the patient, by holding fast to her courage and sustained by the unwavering faith and sympathy of her nurse and doctor, will help herself to get well.

To procure sleep the physician may prescribe somnifacient drugs, but the nurse may perhaps do more with her ministrations—a gentle massage followed by a warm sponge with alcohol, a glass of hot malted milk, quieting of the house, and the suggestion of sleep by word and action. In chronic cases the mind should be properly diverted by day so that at night there will be a natural tendency to sleep. The author has used the radiotelephone in long-drawn-out cases as a means of mental diversion and of keeping up the patient's interest in life.

Surgical Treatment.—The nurse may be called upon to assist at internal examinations of the patient, to prepare for uterine douches, for curetage, even for major operations by the vaginal or abdominal route. The methods of

preparation for all these are given in appropriate chapters, so that repetition is unnecessary. The nurse should not be

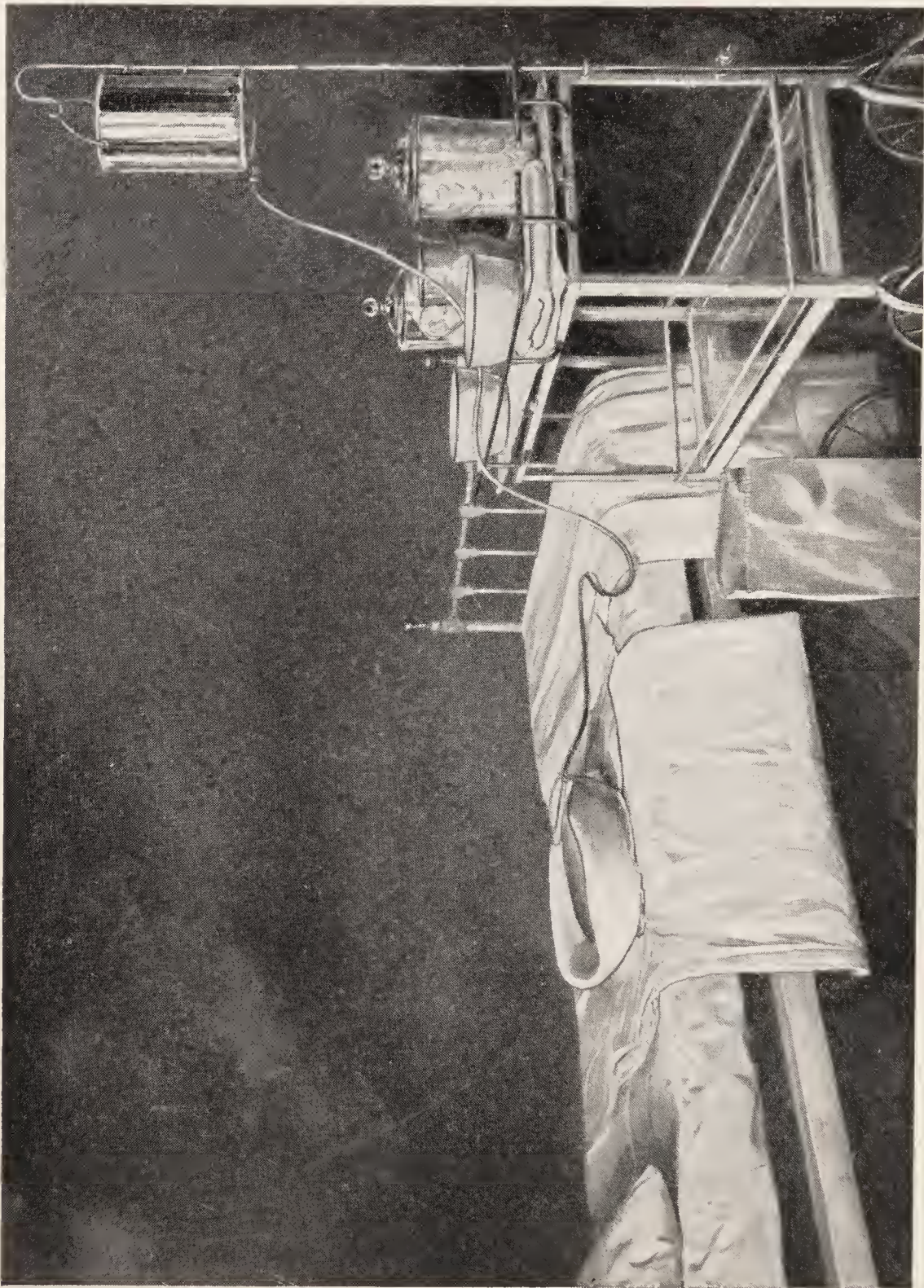


Fig. 191.—Arrangement for giving vaginal douche. The dressings and enemata are prepared for in the same manner.

expected to give uterine douches, although the physician may instruct her to do so. A uterine douche is a more serious matter than was formerly thought. Vaginal

douches may be ordered frequently given, but many physicians are changing their practice in this regard too. The writer does not use them in sepsis. The arrangement for giving the vaginal douche is shown in Fig. 191. When an abscess forms around the uterus, the physician may open it, and in some cases the uterus itself is removed.

The Child.—It is best for the patient not to nurse the baby if her illness is at all severe—first, because she has not the vitality; second, her milk is none too good for the infant; third, the infant may become infected by being so close to a focus of infection. As it is, the babe runs great danger of infection through the nurse unless the latter is fully alive to the situation and takes the extraordinary precautions necessary.

The nurse, if there is only one, should use sterile rubber gloves whenever she touches the discharges of the mother, and another pair when she dresses the navel of the child. It is better to have a special nurse for the infant. If the child does not nurse, the breasts should not be pumped in the hope of preserving the milk. Pumping will not preserve the supply if nursing is long interrupted, and it may lead to an abscess in the breast. The milk will return itself if the child is put again to the breast after not too long an interval. The author has seen the milk return after three weeks. The child may be with its mother very little, and precautionary measures should be constant in preventing infection from reaching its navel, eyes, and throat.

The Nurse.—For difficult cases of puerperal infection two nurses are really needed, and there is plenty of work for both. It is better if one nurse takes the mother and the other the child. The nurse should insist on getting at least six consecutive hours of sleep daily and several hours of recreation in the sunny part of the day, which should be her opportunity to go out and revivify her blood with fresh air and sunshine. The patient, too, will be better for it.

The nurse must be careful not to infect her own hands. Fatalities are known. She must, therefore, care for all cracks and hang-nails. It is wise to use rubber gloves for

GRAPHIC CLINICAL CHART. DESIGNED BY J. P. CROZER-GIFFITH, M.D.

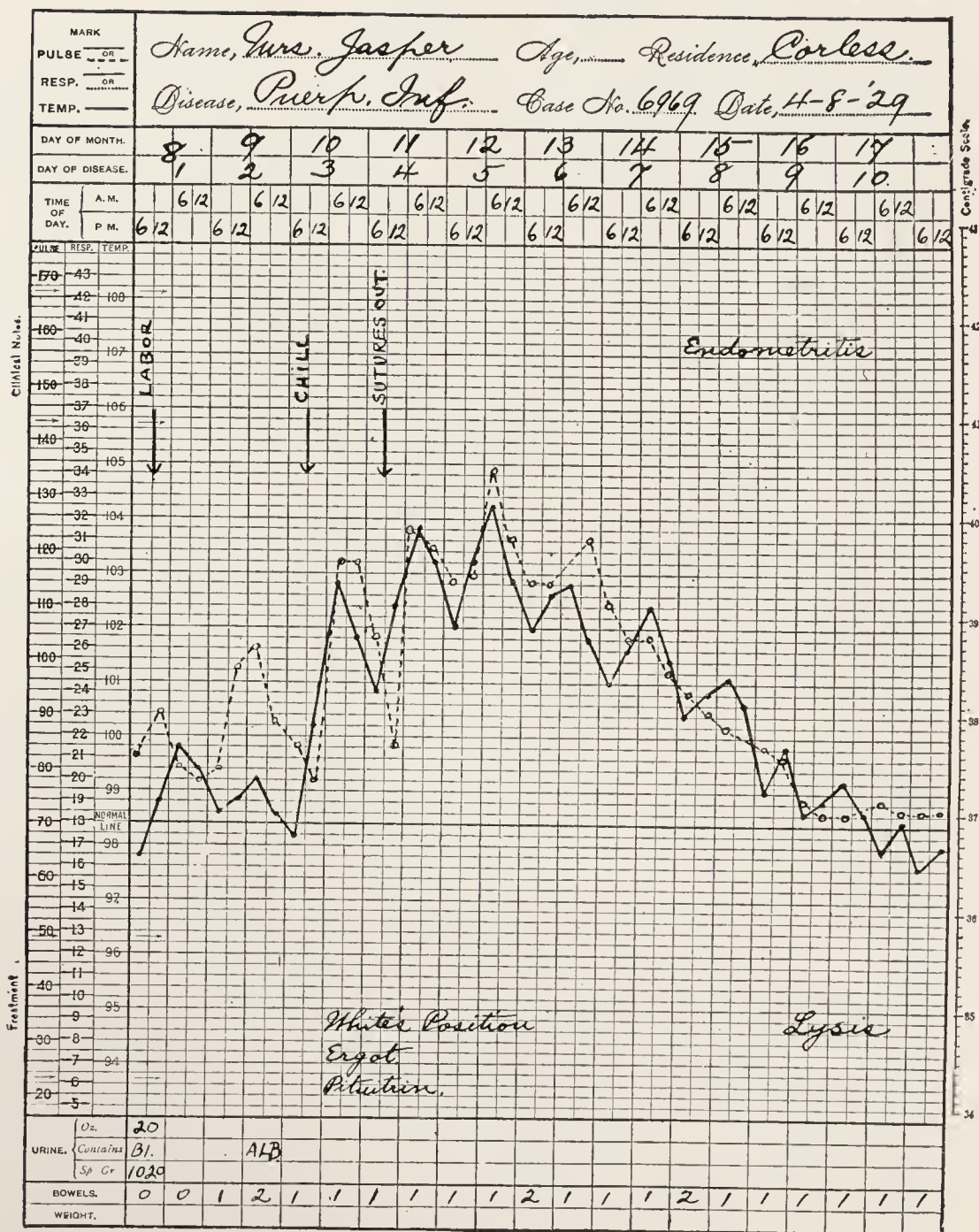


Fig. 192.—Graphic temperature chart of a case of endometritis. The solid line shows the temperature; the dotted line, the pulse. This was a grave illness. Note the high pulse rate.

the vulvar dressings, for this reason as well as for those previously mentioned. If the slightest irritation is observed on the hands, the physician's advice should be sought.

Infection of the nurse's eyes has occurred, therefore the nurse should, as should all hospital or sick-bed attendants, learn to avoid rubbing the eyes and face while on duty and wear large goggles while giving treatments which carry the danger of spattering liquids.

History Sheet.—The temperature in septic cases is very irregular, and the physician will wish it taken every four hours, also the pulse and respiration. A full history sheet should be kept and all unusual occurrences noted. Graphic history sheets aid the physician in acquainting himself with the case, therefore the nurse should learn how to make them (Fig. 192).

Limitation of the Infection.—It is *vital* to the other patients in the hospital that *the infection be restricted to the room in which the patient lies*. The author would like to print these lines in red ink with letters 3 inches high. Here and there in the United States our ancient enemy, "epidemic puerperal fever," is re-appearing in the hospitals. The principle of the prevention of the spread of this disease, like all that are produced by pus-germs, is very simple, but it requires the exertion of constant vigilance and intelligent effort. Limit the infection to the room occupied by the patient; don't let any bacteria get out alive.

All pads and cloths soiled by the discharges from the patient should be wrapped in newspapers as soon as removed and burned. Sheets, towels, etc., should be thrown into a tub of 3 per cent phenol solution and allowed to soak several hours before they are sent to the laundry. In the laundry the time of boiling the clothes should be at least forty minutes, and the boiler must be tightly closed. The blankets used about the patient should be washed like other bed-linen. An effort is to be made to limit the infection to the room occupied by the patient. The nurse, therefore, keeps her utensils together, protects the floor, tables, and other furniture from being soiled by the discharges, and keeps the bath-room free from infection.

The discharges from the vulva, from abscesses, or from wounds should be caught in antiseptic pads, and these surfaces kept clean by frequent dressings. The room is kept free from odor by full ventilation and sunlight. A sun-bath will do the patient good.

The physician should be provided with a sterile gown and gloves for his visit or examination, and with sterile soap, alcohol, and towel for his hands on leaving.

The door-knob is covered with a towel which is kept moist with an antiseptic solution, and, outside the door, the nurse provides a chair or table with a basin of antiseptic solution, or a bottle of alcohol, and some hand-towels. These are used by all persons leaving the infected room.

After the case is terminated the patient is given a new bed; the mattress she occupied is burned, and the bed taken down into the yard and scrubbed and carbolized. Basins are boiled and furniture scrubbed with 3 per cent carbolic solution. The room is thoroughly disinfected (see p. 575), and, in general, the case treated as one of the contagious diseases, although it is not contagious in the accepted sense of the term.

On leaving the case the nurse sends all the clothes she wore while on it to the laundry, and after a full bath and hair shampoo dons aseptic apparel. For the next four days a daily full bath and hair shampoo, using a great deal of soap, are recommended. The nurse may ask why she is required to undergo such thorough cleansing, when the physician goes about among such heterogeneous cases without as many precautions. Let her remember that the physician stays with each patient but a few minutes, and has a change of air between each two calls, while she is in the infected atmosphere nearly seventeen hours out of the twenty-four. Then, too, if she goes to a new patient susceptible to infection, her more intimate association with the case invites sepsis, even if she carries but very little with her.

PUERPERAL THROMBOSIS

The blood in the veins of the legs may stagnate and clot; this is called thrombosis. The return circulation being thus shut off, the part becomes edematous. Usually there is little fever with this—a mechanical thrombosis due to poor circulation and to the fact that the veins are enlarged and tortuous. The element of danger in these thromboses is that a bit of clot may break off and, carried by the blood-stream, reach heart and lungs.

This is called **embolism**, and is often fatal, the end being very sudden and tragic. The patient may have been up and around, when, without any warning, she has a severe pain in the chest, suffers agonizing shortness of breath, turns blue, and dies within a few minutes or hours of anguish most distressful to the beholders who are powerless to save her.

Embolism is nearly always the end-result of an infection which causes thrombosis in the veins around the uterus, the thrombi extending downward toward the feet, and sometimes upward toward the heart. It thus comes well into the class of preventable diseases, where the nurse also has a share of the privileges and responsibilities. One experience, if it were needful, would burn the principles of obstetric cleanliness into the most callous mind. When the patient is known to have thrombosis the nurse will seek to prevent embolism by keeping the affected limb very quiet for several days, and by not rubbing or massaging it. Care should be exerted when the patient moves in bed and when the limb is bathed.

If an infection proceeds from the sides of the uterus and attacks the cellular tissue and the veins about the pelvis, a condition called **phlegmasia alba dolens** results. By the laity this is called “milk-leg,” and refers to the ancient notion that it is due to “driving in of the milk.” It really is an infection which travels along the veins and the cellular tissue of the pelvis. One or both legs may be affected.

The limb is swollen and painful, and the skin is tense and white, almost translucent. It is very tender to the touch. Convalescence takes weeks or months, and often the leg remains swollen for years or swells when the patient is long on her feet.

The nurse will be instructed to keep the patient very quiet, to elevate the limb a little, to apply a warm, moist dressing, a bandage, or special medicines. The foot must not be allowed to support the bedclothes, as "drop-foot" will result. A cradle is used to prevent this. An ordinary electric light hung from the cradle over the leg, protected of course from burning, will help much to relieve pain. Bed-sores will result from poor nursing of the case. Later on, when the fever is gone and signs of inflammation are absent, the doctor may prescribe gentle massage. Sometimes these cases are only part of a general blood-poisoning or pyemia, and then they are really serious, usually fatal.

AFTER-PAINS

Primiparae, unless the uterus contains a clot, are not troubled with painful uterine contractions after the child is born—"after-pains" as they are called. Multiparae are annoyed by them, and they increase in severity with succeeding puerperiums. They are due to lack of tonicity in the uterine muscle, or to the presence of a clot or a bit of placenta in the uterine cavity, in which case they are especially beneficial, as they expel the foreign body. In all cases they are of good omen, though the patient may suffer considerable distress. If the nurse tells the patient this fact, it may help her to bear with them until they disappear, as they do usually within forty-eight hours. During the nursing of the infant the after-pains aggravate, due to the nervous stimulation of the uterus through the breasts—a fact we make use of in practice to get the uterus to contract. In some women the after-pains are of special

severity, and the physician should be informed of it, so that he may prescribe an anodyne. Household remedies are warm fomentations over the uterus; a salt solution enema; compression of the abdomen; a warm drink, soda-mint tablets, and suggestion, the nurse trying to divert the patient's attention. When a clot or other foreign material is in the uterus, the physician may wish to remove it. Preparations are made as for the douche (see p. 312).

TYMPANY

Occasionally after delivery the intestines fill up with gas and the abdomen becomes as large as, and sometimes



Fig. 193.—Rectal dumbbell. Length $2\frac{1}{2}$ inches. Lumen $\frac{1}{4}$ inch.

larger than, it was before the birth of the child. The condition rarely may become dangerous or even fatal. It seems to be a paresis of the intestinal walls or stomach similar to that sometimes occurring after abdominal section. The

physician's attention should be called to it very early, and he will prescribe some carminative by mouth or by rectal injection. Asafetida has proved valuable in these cases, also the stomach-tube. Turpentine stupes and the high rectal tube or the dumbbell shown in Fig. 193 are also used. An enema of milk and molasses, of each \mathfrak{z} viij, is very effective. Chamomile tea makes a pleasant enema. The abdominal binder should be removed. Letting the woman lie flat on the abdomen is sometimes curative. Abdominal massage is practised only on the physician's order. If the tympany is due to a peritonitis, the outlook is gloomy. Nearly all cases not due to inflammation rapidly subside under treatment.

CONSTIPATION

Difficulty may be experienced in getting the bowels to move during the puerperium. In one case the author found a tumor almost as large as the uterus at term filling up the lower abdomen, composed of feces. If cathartics and ordinary flushings prove insufficient, high colonic irrigation with inspissated ox-gall and glycerin may be ordered, or it may be necessary, if the fecal impaction is lower, to remove the mass with the fingers and suitable scoop-like instruments. An ox-gall enema is prepared as follows: 1 dram of inspissated ox-gall is mixed with 2 ounces of glycerin into a smooth paste; with constant stirring water is poured into it until the amount is 1 quart. The mixture is injected slowly into the bowel and retained several hours if possible. For removing hardened feces from the rectum the patient is brought to the edge of the bed, warmly covered, because the operation requires some time, and the nurse, with rubber gloves on, under an intermittent stream of salt solution, loosens and breaks up the masses. Before the operation the fecal mass is softened by an enema of warm olive oil or liquid petrolatum, left in for several hours, and after the rectum is emptied, a few ounces of sterile olive oil or

vaselin (liquefied by heat) are injected to allay the irritation.

VESICOVAGINAL FISTULA

In cases of excessively prolonged labor or instrumental delivery, it occasionally happens that the wall between the bladder and vagina is torn or sloughs out. The resulting

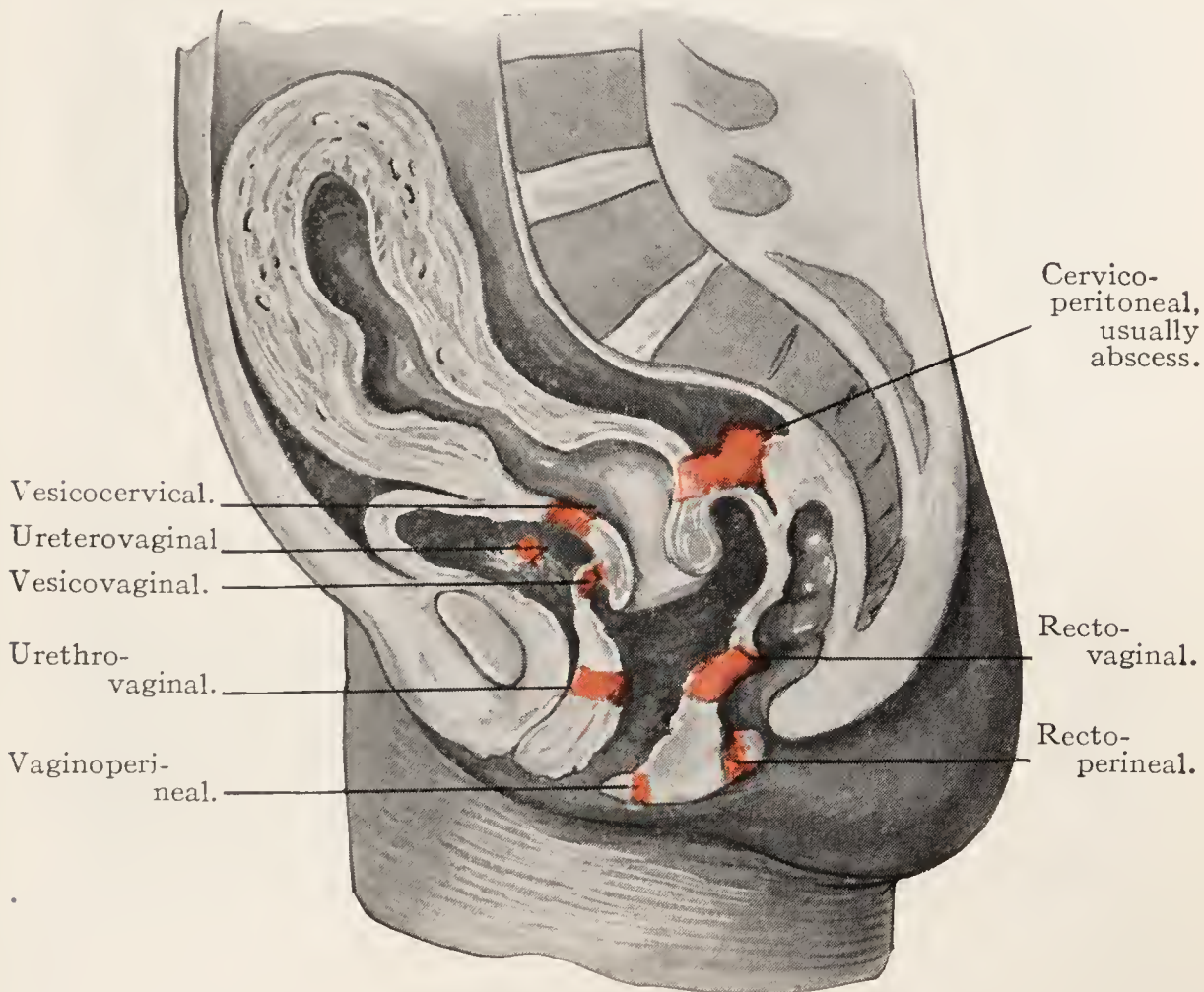


Fig. 194.—Sites of fistulae.

communication between the two cavities is called a vesico-vaginal fistula. If such a communication is made with the rectum it is called a rectovaginal fistula (Fig. 194). In the former case the urine will escape from the vagina continually; in the latter, the feces and gas will continually soil the vagina, both equally deplorable conditions. The nurse will have extra work keeping the parts clean until they are sufficiently recovered to permit a plastic operation.

After vesicovaginal fistula operations usually a permanent catheter is inserted and continuous drainage of the bladder is maintained. The success of the operation depends largely upon the nurse, because if she allows the

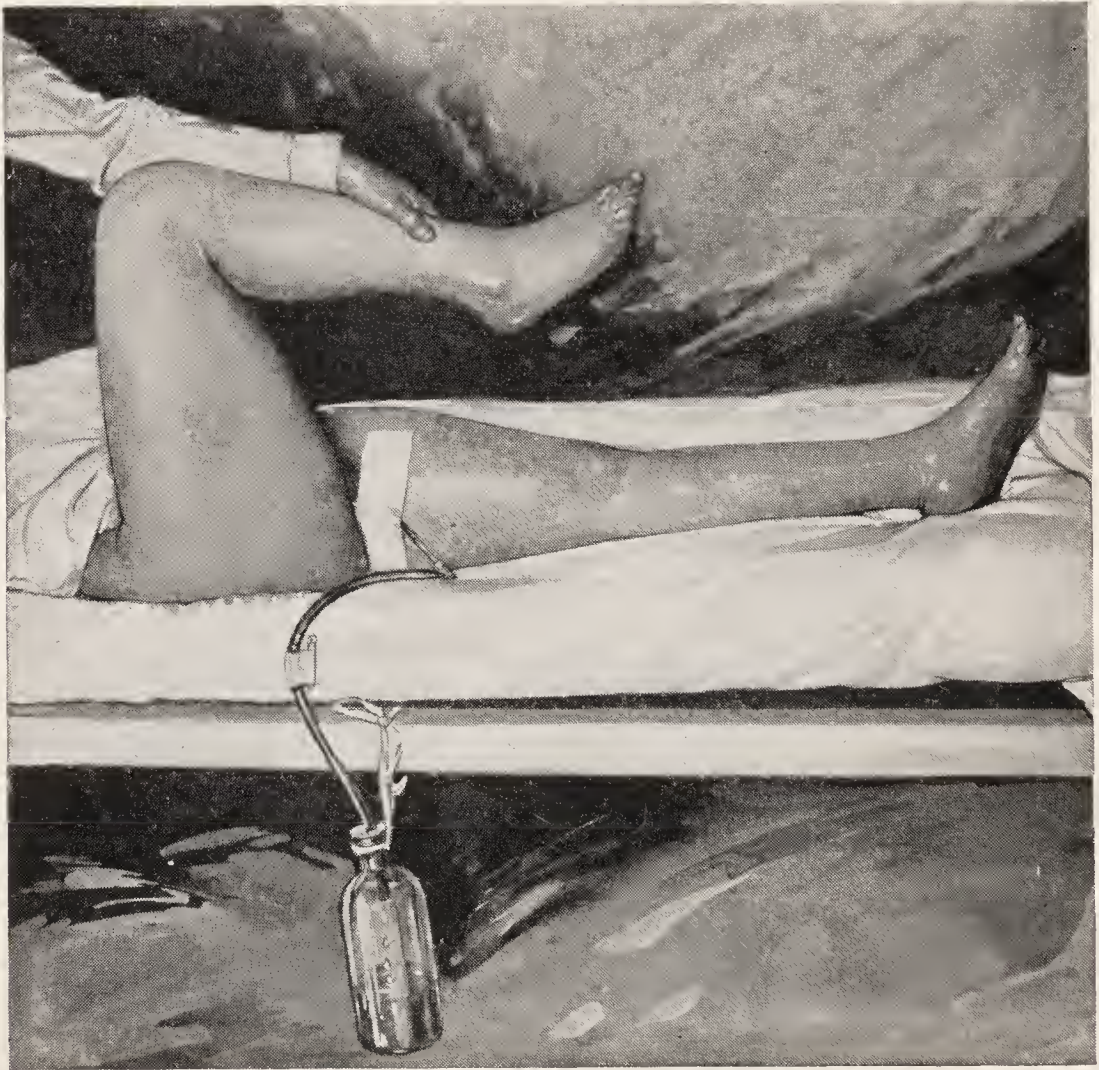


Fig. 195.—Permanent catheter in place, draining into bottle hung at the side of the bed. The rubber tube must be rigid enough to resist compression by the thigh. For the illustration the catheter was fastened on the left thigh. In practice it is fixed on the right one.

catheter to be plugged with urinary salts or to be kinked, the bladder will become overdistended, and, since the urethra is blocked, the urine will find exit through the stitches, thus spoiling the operator's best work.

A No. 16, French scale, soft-rubber catheter is placed in the bladder and fastened to the right thigh with adhesive plaster (Fig. 195). A large glass connector unites it with a

stout rubber tube (lumen $\frac{1}{4}$ inch), leading under the thigh into the mouth of a large bottle hanging at the side of the bed. The nurse observes the urine dripping from the free end of the tube, and she must at once investigate any stoppage of the flow. The dripping must be uninterrupted. Night and morning the catheter is removed and a new one inserted, which must also be done if the urine ceases to flow. Medicines are usually given to prevent excessive deposition of salts in the catheter, which is the greatest menace to success.

A "mushroom" catheter does not require changing. If it stops up, the lumen may be cleared by injecting a little salt solution with a syringe.

CYSTITIS

Inflammation of the bladder is an occasional complication of the puerperium. It may arise from residual urine or infecting catheterizations. In some cases injury to the bladder during labor predisposes to the infection. The nurse can read a warning here—to be always aseptic in her catheterization and to make sure that the bladder is regularly and completely emptied.

The symptoms of cystitis are: painful and frequent urination, vesical tenesmus, pain over the bladder, tenderness on pressure, pus and blood in the urine; later, alkaline fermentation in the bladder.

The treatment is both internal and local. The patient will be given some urinary antiseptic, like hexamethylenamin, and the physician will perhaps order the bladder washed out with saline solution or some weak antiseptic, *e. g.*, $\frac{1}{2}$ per cent nitrate of silver or 1 per cent mercurochrome. Washing the bladder is simple, the preparation being the same as for catheterization. After the urine is drawn off, the tube of the douche-bag is attached to the catheter and the bladder allowed to fill. The bag is held 18 inches above the pubes. The water is then allowed to

escape, and this lavage is repeated several times at each sitting.

If the physician wishes to cystoscope the patient, that is, look into the bladder, the nurse will prepare for this in the same manner as if she were going to wash out the organ. In addition, she should provide a tall jar for solution in which to place the cystoscope, a sterile syringe holding 2 ounces, and 1 quart of sterile water as clear as crystal. This water the physician uses to distend the bladder while he is looking into it with the cystoscope. Cystoscopes (excepting the simple tubular ones) must not be boiled, and are to be delicately handled.

Method of Collecting Sterile Urine.—It is often needful to determine what organism is present in the urine, and the doctor will order a "catheterized specimen for culture." A 4-ounce bottle with cork and two catheters are sterilized in the autoclave. Several hours must elapse before drawing the urine. The patient should be in a good light; with sterile gloved hands the nurse irrigates the vulva and the mouth of the urethra with 0.5 per cent lysol solution, directing a fine stream into the latter so as to wash out its lower portion. Now let the woman pass a little urine herself, and then pass the catheter, using extreme care not to let it touch anything. Let $\frac{1}{2}$ ounce of urine escape; then collect the specimen, corking the bottle tightly. Label with name, date, and time of day.

The Two Basin Method.—Some physicians object to catheterization on the ground that lochia are unavoidably carried into the bladder and infection, with cystitis, results. The author has devised the "two-basin method" to avoid this danger, and it is successful in almost half of the cases. The patient should not void for five or eight hours. The nurse washes the vulva and introitus carefully, and requests the patient to urinate into the first of the sterile basins—bearing down or straining a little at the same time so as to eject the stream with some force. After a little urine has been thus passed the nurse slips the second sterile basin quickly under the arched stream of urine as it passes through the air. The urine in the second basin is sent to the laboratory labeled "Two-basin Specimen."

HEADACHE

A woman should not complain of headache during the puerperium. If a headache comes on after labor, the nurse

should watch for other symptoms of eclampsia. If a woman has lost much blood at the labor she may suffer from an anemic headache. There is a headache from exhaustion, from too much excitement, as too many or irritating visitors, from hunger, from too much ergot, and from insomnia. Sometimes the eyes are at fault, and the patient may have to wear eye-glasses in bed, and if a woman with weak eye muscles looks down at her baby all the time it is nursing she may acquire a headache from eye-strain. Constipation is another cause of headache, and neurasthenia also. The physician will inquire into the cause and seek the remedy, but the nurse may do much, both in prevention and cure, by exercising her art—nursing.

SUBINVOLUTION

Subinvolution means that the uterus, vagina, and pelvic floor have not returned to their former state. The uterus is large, soft, and even if the bladder and rectum are empty, lies many fingerbreadths above the pubis. The lochia are profuse and sometimes blood-stained, the vulva patulous, its weak muscle-tone being only part of a general flabbiness. The causes of subinvolution are infection, extensive birth injury, exhaustion, and lack of recuperative power. Hemorrhage may take place from a subinvolved uterus, and invalidism may be a permanent sequel. The doctor may prescribe ergot and hydrastis, or other hot vaginal douches, a prolonged rest in bed, bed exercises, general massage, tonics—everything that will build up the patient's general health.

DISEASES OF THE MIND

Nervous Breakdown.—Upon the first awakening after her baby is born the new mother looks out upon an entirely different life, one full of new pleasures, to be sure, but also replete with duties and responsibilities as well as abnegations. Fortunately the majority of women are normal and

the joy of motherhood transports them safely over the rocky period of mental and emotional readjustment to the situation. The weak-willed woman, the psychically undeveloped or congenitally unfitted individual who, put under a strain in any other circumstances would fail, and develop a neurosis or a psychosis, and even a normal woman whose physical and nervous resources have been too much depleted, may not be able to make the proper adaptation, but breaks down, and one or the other form of nervous disease appears. This is usually in the form of an exhaustion neurosis or psychosis, and resembles in some respects the "shell shock" of soldiers during the war. (See p. 217.)

Puerperal Insanity.—This sad accident is not very infrequent. It occurs most often in women with an hereditary taint of insanity in the family, in cases of toxemia during pregnancy, after eclampsia, after long exhaustive labors, or hemorrhage, and after sepsis post-partum. Melancholia and mania are both found, and one may lead to the other. In both forms suicidal tendencies are marked, and the mother may try to destroy the child. After recovery she may repudiate her own infant, or only slowly learn to love it.

The symptoms of beginning puerperal insanity are sleeplessness, anorexia, delusions of sight, hearing, smell, loss of love for the infant, even hating it. The patient may become acutely maniacal, with extreme and exhausting jactitation, and try to jump out of the window; or she may lie apathetic and melancholy, but may suddenly make an attempt to kill herself or the baby.

Treatment.—There are three important parts of the nursing care of such cases: First, prevent the patient from committing suicide and from killing the baby; second, procure sleep; third, keep up the nutrition.

To accomplish the first—*prevention of suicide*—the patient should be isolated in a room whose windows are barred. If they are completely covered with double wire fly-netting

nailed down it is sufficient, and does not give the patient the idea of a prison. All pictures and extra furniture should be removed, and everything that has a polish which may give reflections and which the patient may misconstrue; also everything that is sharp or cutting, as glass, table-knives, or forks. Nothing movable save the table, divan, and heavy upholstered chairs should be at hand.

The patient must not be left alone an instant. Two nurses are absolutely necessary. When the child is with the mother, the nurse must watch her very sharply, as she may strangle the little one before it can be drawn away from danger.

The general rules for nursing the insane are applicable here, and it is desirable that a nurse having such special training be employed. For the exhausting jactitation, gentle restraint may be absolutely necessary, but one should remember that restraint is also exhausting to the patient.

Procuring Sleep.—The physician will prescribe somnifacient drugs, of which hyoscin, scopolamin, morphin, amytal, and chloralamid are usually selected; but the nurse may do much to procure rest for the patient. Let her give the enema and the bath in the evening, or an alcohol rub, with general massage, followed by a cup of hot malted milk or an egg-nog. A prolonged hot full bath (with an ice-cap to the head), then bed, with an enema of 60 grains of sodium bromid, will often succeed in procuring sleep. Absolute quiet must reign throughout the house, and no visitors be allowed. The patient must sleep.

Nourishment.—This is of great importance and difficult, because the appetite is gone and the patient may try to die by starving herself. She may imagine herself too wicked for the food given her, or have other delusions, and the nurse may make use of her delusions to insinuate food. All the art of cookery and the arts of the nurse are to be used to provide sufficient nourishment, and the nurse should keep an accurate record of the daily amounts ingested, so

as to be able at all times to show the physician that the puerpera is not suffering. Should the patient refuse nourishment, she will have to be fed with a stomach-tube.

Saline solution is sometimes administered hypodermically. It may make the patient hungry. If the mother has milk, she may nurse the infant. Let the nurse watch them carefully; usually the milk secretion diminishes, or the infant does not thrive, and it is best to wean it.

These cases require from two to eight months for recovery, although occasionally this may never be complete. An important question is the removal of the patient to a sanatorium. In the writer's opinion this is usually by far the best course. If the patient can have skilled nurses and all the care she could get in the sanatorium at her own home, with complete isolation, she may be as well cared for at home.

CHAPTER IV

COMPLICATIONS OF THE PUERPERIUM—(Continued)

DISEASES OF THE BREASTS

WHILE in all other matters related to the confinement the nurse shares with the doctor the responsibilities for the prevention of accidents and disease, the breasts are her particular province, and if she can forefend complications of lactation and secure an adequate milk supply for the infant, she is entitled to almost all the credit and satisfaction.

The most common disorder affecting the breasts is **simple engorgement**. The general notion is that the breasts are overfilled with milk. This is true only in part. While a small amount of milk forms spontaneously in the breasts, the symptoms are due to lymphatic and venous engorgement. One can see this in some cases, even the skin being edematous. The engorgement occurs on the second, third, or fourth day, when the "milk comes in," and it may occur at the time of suddenly weaning the child, when the usual relief of engorgement produced by nursing is absent.

Symptoms.—The breasts are very heavy, painful, and hot; they feel warm but there is no rise of body temperature. There is no such thing as "milk-fever"—a fever the ancients ascribed to the engorgement of the breasts on the third or the fourth day. Fever at such times is usually due to infection. Examination of the breasts shows them to be much enlarged, tender, sometimes edematous, and of a bluish, mottled appearance. The nipple is flattened so that the child cannot grasp it, and the secretion of milk may be suspended—the breasts are choked up with swelling

and sometimes lumps or “cakes” are formed. The part of the gland running up into the axilla enlarges too, and the patient cannot bring her arm to the side.

If left alone, the engorgement gradually disappears, the gland becomes soft, and the milk flows readily when the child nurses. If irritated by too much or too rough massage, by breast-pumps, and too frequent nursing, the engorgement is slower in going down, but it will gradually disappear.

Treatment.—The practices of physicians vary. Some apply heat; others cold. Some order the breasts simply



Fig. 196.—The breast-binder applied.

suspended, others prefer them tightly bound (Fig. 196). A saline cathartic is often given to draw the blood away from the breasts. Massage is practised only on the physician's order, and the same is advised in regard to the breast-pump. Neither massage nor the breast-pump is to be employed when there are signs of inflammation in the breasts.

The practice of the author is as follows: If the engorgement is severe and causes much pain, a saline laxative is ordered, and liquids by mouth are restricted. The infant

is allowed to nurse only every four hours. The breasts are tightly bandaged and an ice-bag is applied to each of them. These measures will almost always prove adequate. If they do not, the nurse gently massages the breast for five minutes and then reapplies the binder. If this brings no relief, which is unusual, a hot saline dressing is applied. Aseptic gauze is wrung out of hot salt acid solution, both breasts snugly padded with it and over all a layer of oiled silk and a

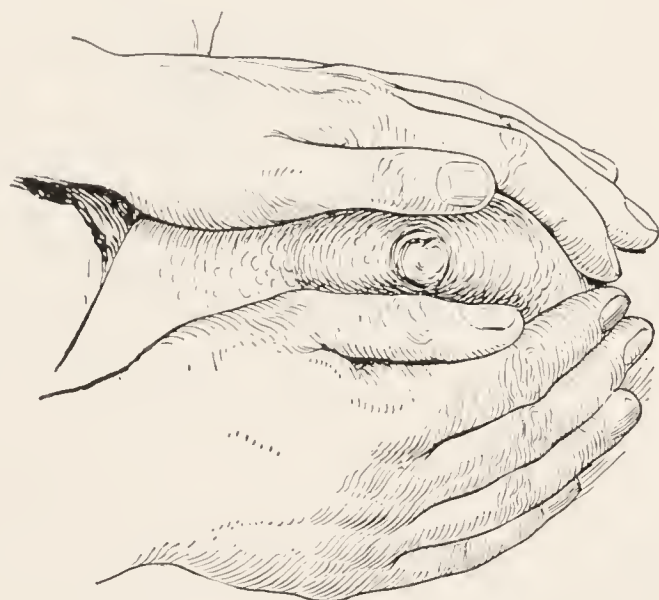


Fig. 197.—Massage of breast: Even compression of entire breast.
First motion.

bandage are placed. This is sometimes more grateful to the patient than the ice. If compression is wished in addition, a round oatmeal bowl may be inverted over each breast and bandaged on.

Massage is carried out as follows: The nurse sterilizes her hands and anoints the breasts with sterile albolene or oil. The first motion (Fig. 197) is one of even compression of the whole breast. Both hands are spread out as evenly and smoothly as possible over the breast, and firm compression exerted against the chest. The blood and lymph are thus pressed out and away from the gland. On removing the fingers the nurse may see depressions in the surface. This pressure is not painful—just the contrary.

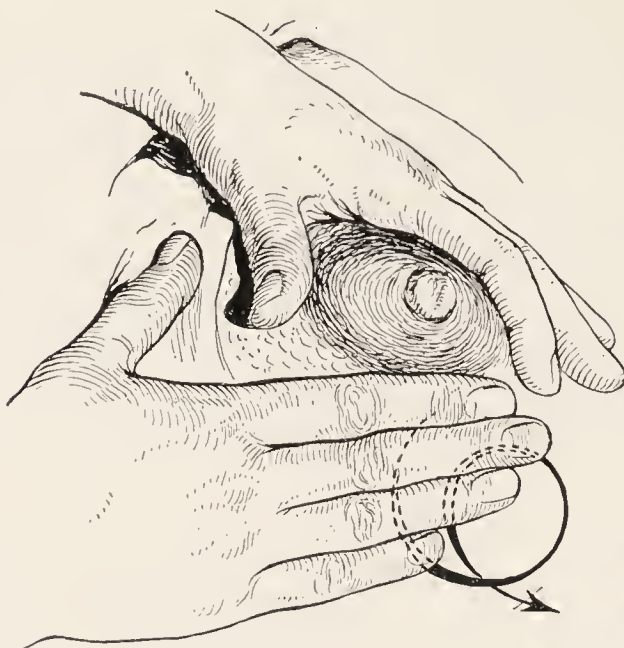


Fig. 198.—Massage of breast: Pressing the lymph in the direction of the peripheral lymph-vessels. Second motion. The arrow shows the motion of the finger-tips.

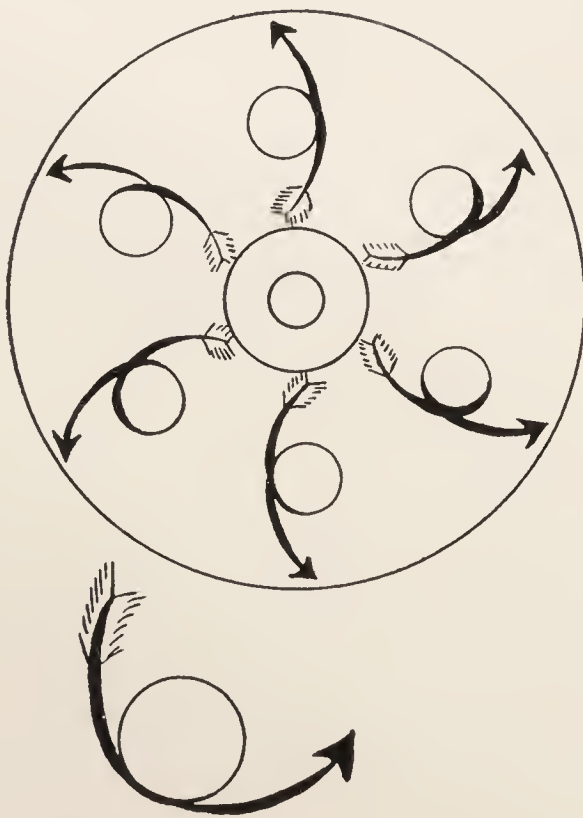


Fig. 199.—Diagram of the breast strokings in the second motion. The shaded portion of the arrows shows the increase in pressure of stroke.

After this even pressure has been practised a few minutes and all the gland covered, gentle circular strokings are made from the nipple toward the periphery (Fig. 198). The four fingers make circles around the nipples, pressing a little harder as they go away from the nipple (Fig. 199). The breast is steadied by the other hand. The idea is to press the lymph out of the breast.



Fig. 200.—Massage of breast: Wiping the milk toward the nipple. Third motion.

After circling the breast twice, the third motion is instituted (Fig. 200). One hand steadies the breast, while four fingers of the other hand wipe the milk toward the nipple. Any milk formed is thus squeezed out of the nipple. This is the least important of the three motions. The last maneuver is a repetition of the first, and nearly always the patient will feel much relieved by the procedure, even though no milk has been expressed, that is, providing the nurse has been gentle in her manipulations. The breasts are now bandaged smoothly and tightly.

Abnormalities of the Nipples.—The normal nipple varies much in different women. Figure 201 gives silhouettes of many forms. If the nipple is flat, or even depressed,

the child may be unable to get hold of it. Engorgement of the breast is common, and if fruitless efforts at nursing are persisted in, cracks occur and abscess may be the final result. If the child cannot quickly develop a nipple sufficient for sucking, and if the milk does not flow readily with

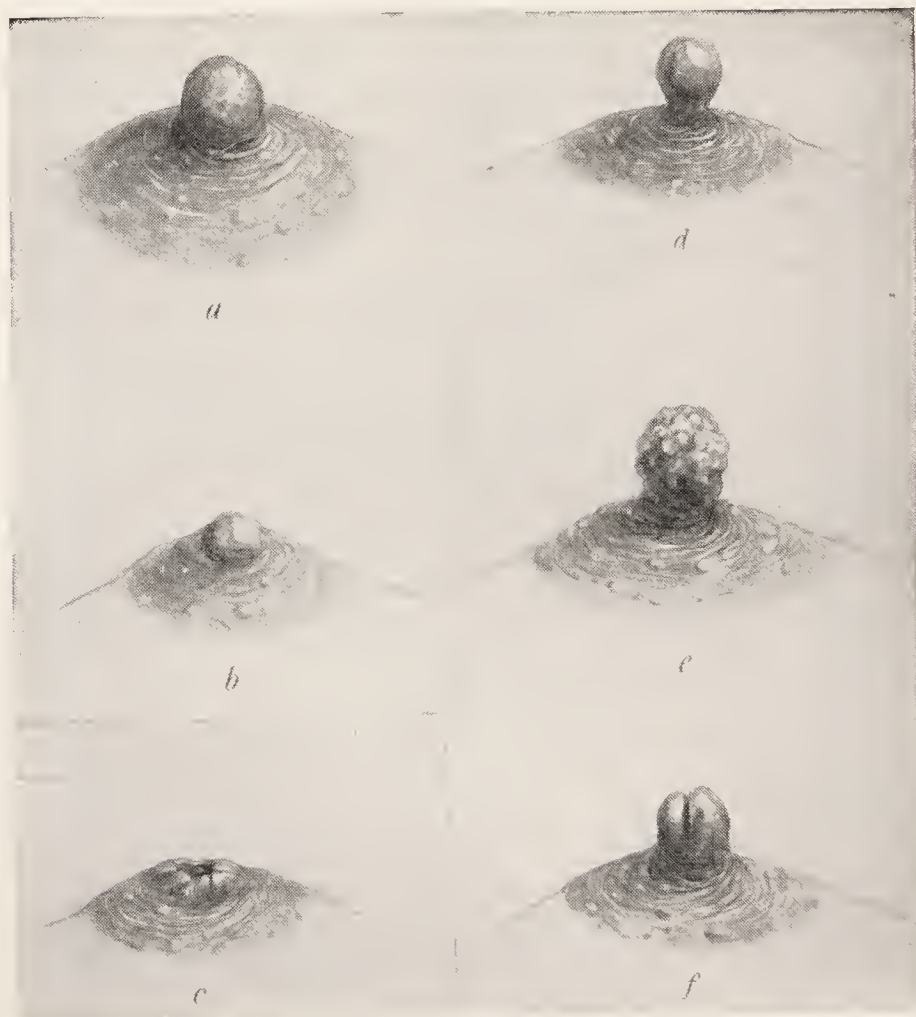


Fig. 201.—Diagram of variously formed nipples: *a*, Normal nipple; *b*, flat nipple; *c*, inverted nipple; *d*, polypoid nipple; *e*, mulberry nipple; *f*, bifid nipple.

the use of a nipple-shield it is best to discontinue nursing. During pregnancy attempts should be made to develop undersized and depressed nipples. (See p. 110.)

If the nipple is congenitally fissured, as the mulberry nipple; bifid, as the double nipple, or pedunculated, the tendency to crack is marked, and trouble with nursing is inevitable.

Cracks, Fissures, and Blisters of the Nipple.—These are very important, because they sometimes render nursing difficult or impossible, to the detriment of the infant, and they may also lead to mastitis, with abscess. The integrity of the nipple must, therefore, be preserved. The nurse should frequently inspect the nipples, to detect a crack or blister in its incipency, especially if the patient complains of tenderness when the babe grasps the nipple. If she cannot find a crack with the unassisted eye, a magnifying-glass in good light will usually show one. Sometimes there is an unexplained sensitiveness of the nipple. This occurs in neurotic women, and may be so acute as to forbid nursing, even though there is a good milk-supply. Sometimes the infant bites the nipple unnecessarily. It is a habit, and should be cured by gently patting him on the back until he learns better. Sometimes the baby will not let go of the nipple, preferring to keep it in the mouth, even when not nursing. This must not be allowed. To remove the nipple from the infant's mouth without hurting the nipple squeeze the cheeks into the space between the little one's jaws, which will separate them, letting in the air. Do not pull the child from the breast.

Cracks are longitudinal or circular; the latter are the worst. A crack may deepen into a fissure, and a fissure, if transverse, may partly amputate the nipple. If longitudinal, it may split the nipple. A blister often precedes a crack, and a little superficial ulcer may result from a blister.

Blondes are more liable to these affections than brunets, and red-haired women seem particularly predisposed, perhaps because their skin is so thin and delicate. The precautions to be taken in order to avoid such occurrences during pregnancy are given on p. 110, under *The Hygiene of Pregnancy*.

As soon as a crack is discovered, it should be reported to the physician and treatment should be instituted. A great

many methods are employed. The author uses the following, but the nurse will do well to get exact instructions from the attending physician: First, the intervals of nursing are lengthened to four hours and the breasts used alter-

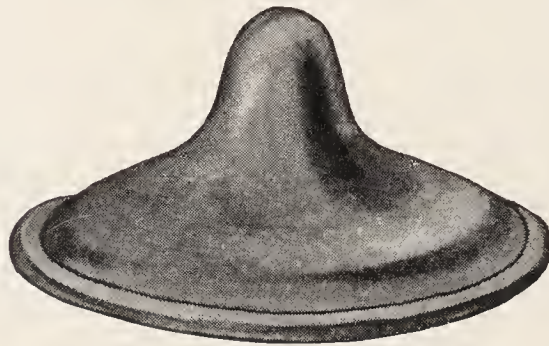


Fig. 202.—Wansbrough's leaden nipple-shield.

nately; second, Wansbrough's leaden nipple-shields (Fig. 202) are applied. These are little shields made of thin lead having the shape of a sugar-loaf hat. They are scoured with Sapolio, boiled, and then applied to the nipples, being

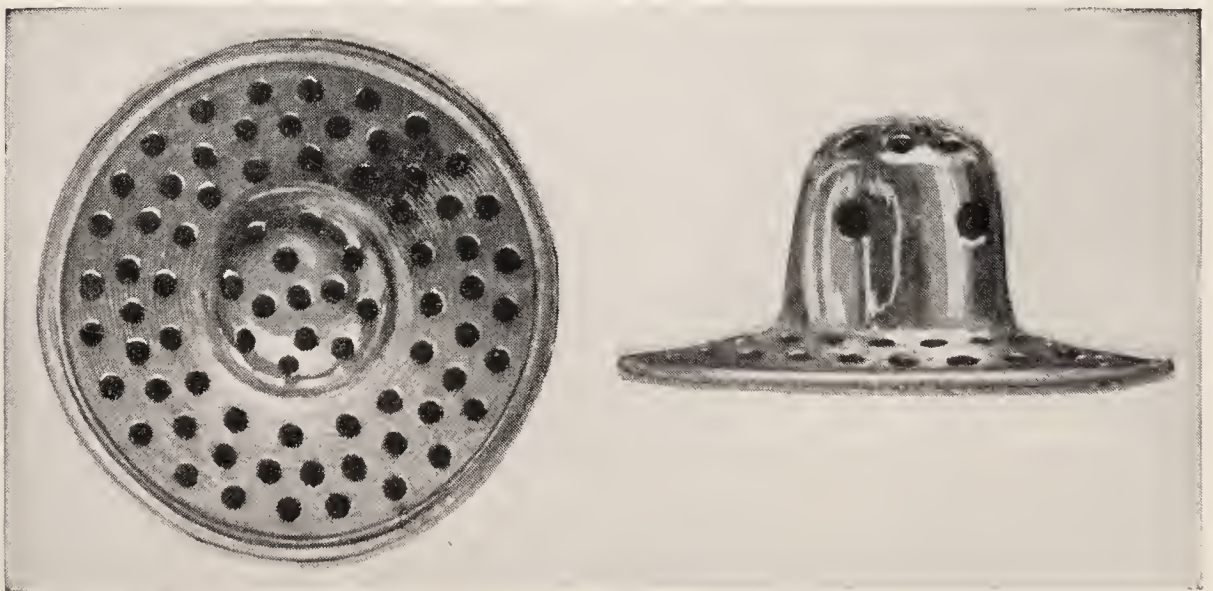


Fig. 203.—Ziegler's aluminum shield.

supported by a bandage. The theory is that the lactic acid in the milk acts on the lead, and the nipple is bathed continuously in a sort of lead-water application. This explanation has been questioned, but the fact remains that the little appliance is very successful in curing cracked and

ulcerated nipples. To hasten the cure, or if the leaden shields are not used, the crack or blister is brushed with a 5 per cent solution of nitrate of silver. If there is a deep fissure or ulcer, it is best to begin the treatment by touching



Fig. 204.—Dry air treatment of cracked nipples using ordinary tea-strainers with some extra perforations.

it up with a 20 per cent solution of nitrate of silver and then apply the shields.

Before nursing the shield is removed, the nipple washed with saline solution, and a glass nipple-shield applied. (See Figs. 98, 98a.) To get the infant to nurse with this shield it is well to fill it with sterile water before inverting it over

the nipple. The child sucks out the water and the milk follows. Should the milk start with difficulty, a hot application will bring it to the surface. A few cases of lead poisoning in infants have been reported. These were due to neglect of the precaution to wash the nipple after removing the lead shields and to too prolonged use of them. A lead shield may be worn for two weeks safely.

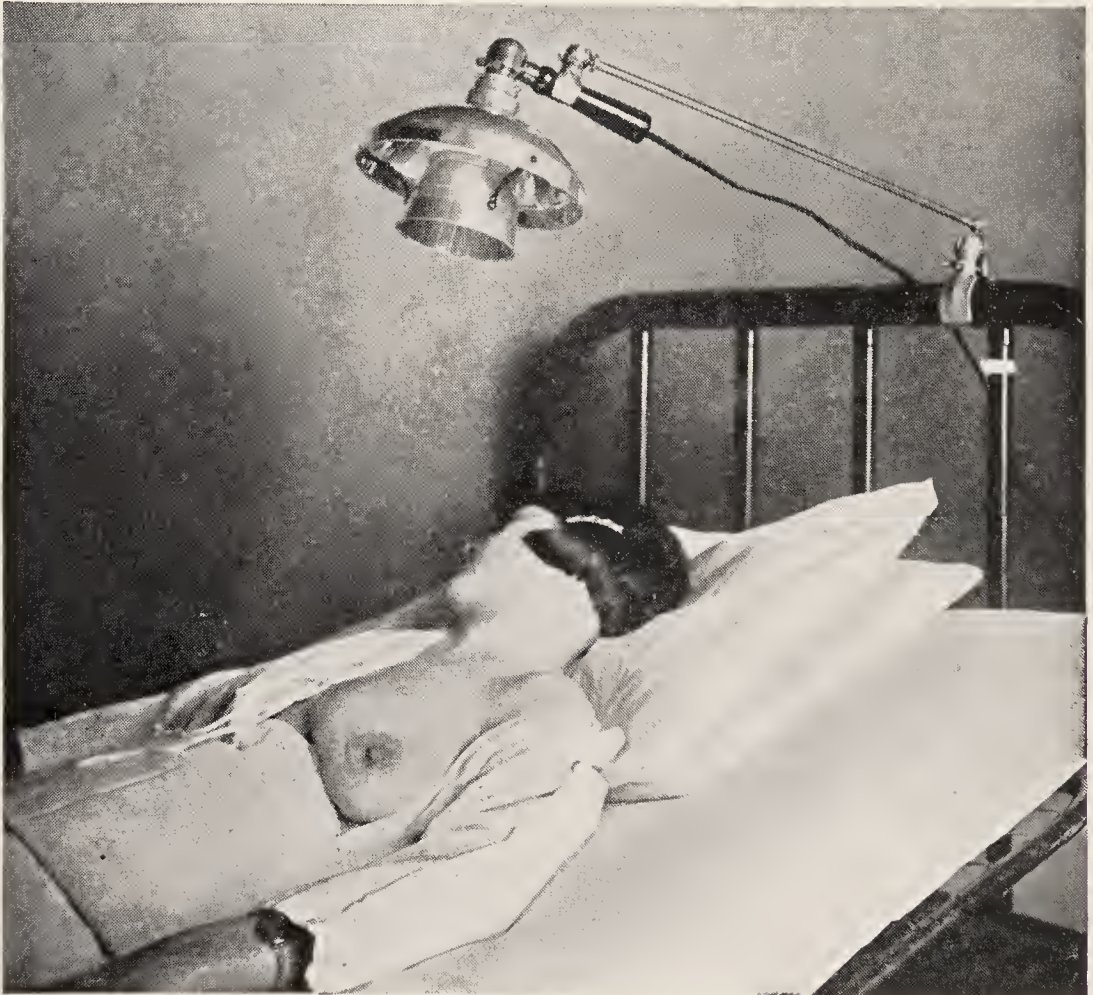


Fig. 205.—Treatment of cracked and tender nipples and breasts with a therapeutic lamp.

Sometimes the above treatment fails, although the author is very seldom thus disappointed. In these cases he uses astringents, and the best is nitrate of silver. The nipple is washed with a 5 per cent solution of it morning and evening, and it is allowed to dry in, in the sunlight. Then the nipples are covered with ordinary tea-strainers held on with a properly fitted binder (Fig. 204).

If the fissure is a deep one, the child should be kept from that breast for a few days. In this time, with the nitrate of silver application and the leaden shields, the fissure will have healed sufficiently to allow nursing with the glass shield. Recently we are getting quick cures of cracked nipples by exposing the breast to the rays of the thermalite (therapeutic) lamp for twenty to thirty minutes morning and afternoon (Fig. 205).

It is not necessary to say here that extreme asepsis must be practised to keep these cracks from being infected, because the nurse knows that germs gaining access through a fissure may cause a breast abscess. The glass nipple shields must be boiled twice a day, and when not in use should be kept dry in a covered jar. Milk curdles in the folds of rubber nipples, and for its removal the rubber needs to be turned inside out.

Among the hundreds of remedies for cracked nipples, only compound tincture of benzoin, glycerin, glycerin with boric acid, castor oil and bismuth, and alcohol need be mentioned. They may be used as succedanea. A dressing of 70 per cent alcohol applied for four hours A. M. and P. M. sometimes cures when the other remedies fail.

If the nursing is painful and no crack is discoverable, an application of 5 per cent nitrate of silver should be made, and the glass nipple-shield used for nursing. Occasionally a soft-rubber nipple-shield does better than the glass one.

Mastitis.—Inflammation of the mammary gland or the tissues about it is called mastitis. There are four varieties. The inflammation may be in the skin around the nipple, or a little abscess may form in one of the tubercles of Montgomery. The inflammation may be in one or more lobes of the gland—the so-called parenchymatous form, or glandular mastitis. If the inflammatory process occurs in the fat and loose tissue between the lobes, we speak of periglandular cellulitis or phlegmonous mastitis, and if the

infection travels beneath the gland to the connective tissue which fastens the mamma to the chest wall, we find pus under the gland, and speak of submammary abscess. This is very serious and, fortunately, rare. The commonest is the parenchymatous variety, and it is the most amenable to treatment (Fig. 206).

The cause of all these forms is infection, usually by the *Staphylococcus aureus*. Bacteria obtain access to the gland and set up inflammation. The different varieties spoken of are made by the different routes which the germs travel before they cause the inflammation. Normally, many breasts contain germs, but these are either naturally harmless or they require special conditions to make them virulent. Such conditions are cracks, fissures, ulcers of the nipple, bruising of the breasts, either by too brisk massage or other injury, too much pumping of the breasts, squeezing of the breasts, and efforts to get them to secrete milk when they cannot do it. It is a question if simple milk stasis causes abscess. Surely engorgement itself does not. Overstimulation of the breast may result in infection and abscess. The germs are often carried directly to the breasts on the fingers of patient or nurse from the lochia, from an infected umbilicus, or from any source of infection. As a rule, these cases may be prevented by proper protection of the organ and continual watchfulness in avoiding contamination. If there are cracks or fissures, asepsis must be especially thorough, as it is here that the infection usually gains entrance.

Symptoms.—The symptoms of mastitis are pain in the affected breast, and particularly in one spot, and tenderness and swelling of the same; there may be a chill, and there is nearly always fever, which may reach 105 F. The pulse is high, and we observe all the manifestations of a febrile attack—headache, malaise, pains in the bones, hypersensitiveness to light, etc. The part of the breast that is inflamed is hot and tender, and later may be reddened. If,

under treatment, the fever and other symptoms abate within forty-eight hours, one may feel encouraged that an abscess will not form. If the fever remains high for more than two days, one will have to fear this outcome. With proper treatment the prognosis is good. In almost all cases an abscess can be prevented.

Treatment.—As soon as the nurse detects the first sign of inflammation of the breast she notifies the attending physician, and until he comes she withholds the child entirely from the breast, and applies a very tight breast-binder. The physician may order ice applications. These must usually be kept up constantly for forty-eight hours. Two large ice-bags are applied to each breast and they are kept half-full, so that they be not too heavy on the chest. The breasts are supported by a thin binder, and the ice-bags lie directly on this, not separated from the skin by enough cloth to prevent the cold from reaching the gland. The skin must feel really cool to the touch or no good is being derived from the ice. If the patient becomes chilly, a hot-water bag is applied to the feet and the arms are wrapped in flannel. A saline cathartic is usually ordered, and the liquids in the diet are restricted. With these measures the inflammation almost always subsides without suppuration. The ice-bags are removed one by one after the patient has had a normal temperature for twelve hours. The child is put back to the breast twenty-four hours after the fever is gone and at least six hours after the last ice-bag is removed.

The nurse may be asked if the milk will not permanently dry up if the child does not nurse for several days. Experience shows that it does not. Even non-pregnant women can start the breasts to secrete milk by putting a vigorous infant to the nipple. A maid who was given the care of an infant at night kept it quiet by letting it suck on the nipple. Milk appeared and she wet-nursed the child. The same occurrence was noticed in a woman forty-nine years old

whose daughter died in labor. She suckled the child, although her bosom had not been pressed by an infant for fourteen years.

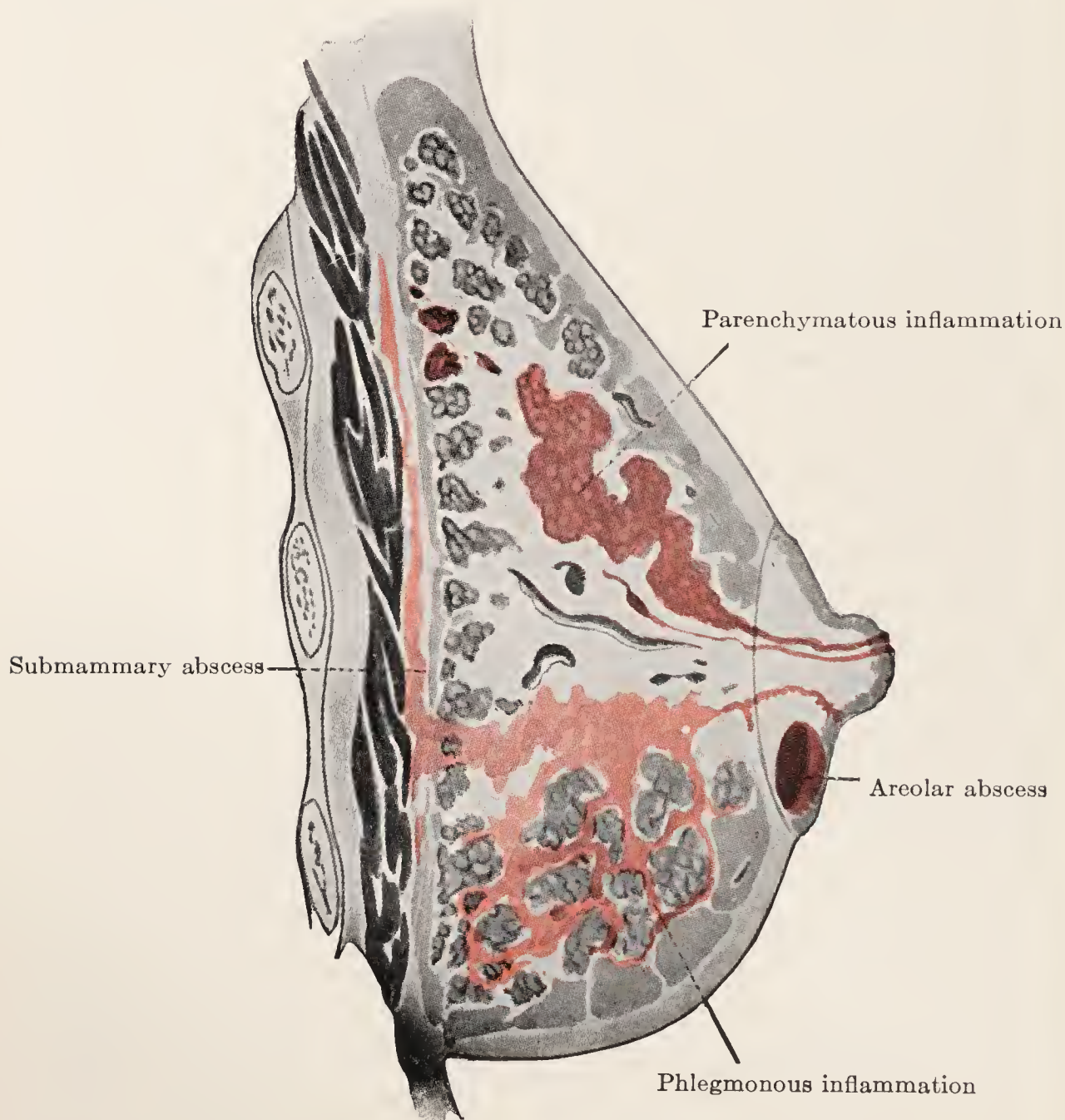


Fig. 206.—Diagram of breast infections.

No massage or pumping of the breasts is allowable at any time during the treatment of mastitis. Should an abscess form, the condition being shown by irregular temperature, chills, and softening and redness of the inflamed portion of the breast, the nurse will be required to prepare for operation—that is, for draining the breast.

The operation is usually done in the surgery of the hospital, but may be done at home as well, and even in the patient's own bed (Fig. 207).

The instruments required are: 1 scalpel; 2 scissors; 2 short, 2 long artery forceps; 1 tube No. 1 catgut, 6 strands of silkworm gut; 1 needle-holder; 3 needles; 2 pieces rubber drainage-tube (size selected by operator); 2 sterile gloves or rubber for packing and drainage (unless the operator



Fig. 207.—Preparation for opening breast abscess in bed: *a*, Breast-binder; *b*, oiled silk; *c*, *c*, newspaper, torn away to show *a* and *b*; *d*, bath towel.

prefers gauze); 6 large safety-pins; 1 pus basin. Ether and mask, etc.

One basin with strong lysol solution, tincture of iodine for the skin, and a basin of hot boric solution for the eventual wet dressing are placed on a side table.

If the operation is done on the patient's bed, the latter is prepared as follows:

1. A broad breast-binder is laid in proper position (Fig. 207, *a*).

2. Over this a large piece of oiled paper, or cellophane, or oiled silk (Fig. 207, *b*).

3. Next comes a thick large pad of newspapers, reaching from the head down to the hips, and covering the binder (Fig. 207, *c, c*. Pad is shown torn away).

4. Now adjust 2 bath towels over the newspapers (Fig. 207, *d*).

5. The blanket is rolled down and protected with bath towels over newspapers.

6. The arm and shoulder of the affected side are covered with thick towels.

7. When the patient is asleep the operator covers the field with sterile towels.

The rest of the bed is protected by thick newspapers, covered by a sheet, all securely pinned in place. The floor is also protected. All this is to avoid spreading pus.

The surgeon usually waits on himself from a side table upon which the nurse has placed the pan of instruments, solutions, etc., ready to hand. He threads the needles and prepares the drainage-tubes while the patient is being anesthetized. He exercises extreme care to keep the pus, etc., from infecting the bed and floor.

After the operation the wet dressing is applied, and while the physician holds it in place, the nurse removes the sterile towels, the bath towels, the pad of newspapers, and exposes the cellophane or oiled silk underneath. This is drawn up over the wet dressing; then the clean binder, which is already in place, is fastened over all.

The towels and sheets are soaked in lysol solution before being sent to the laundry. Pads, sponges, and infected dressings are rolled up in thick newspapers and burnt. (See p. 575, *Sterilizing Apartments*.)

After the abscess is opened the nurse, having to dress it, should be careful not to carry the infection to the woman's genitals or to the baby's navel. Rubber gloves should be used for dressing the breast. Suppuration is often prolonged, and there may be a succession of abscesses, fairly riddling the breasts and disfiguring them. In addition, the

general health may suffer, therefore in these prolonged cases the nurse will arrange for a generous diet, outside living, and all the factors making for rapid recuperation. The baby should not nurse from the mother. It may get infected—pemphigus, pneumonia, gastro-enteritis, etc.



Fig. 208.—Bier's congestion treatment of mastitis.

Another treatment of mastitis is the "congestion therapy" of Bier. A large dome-shaped glass is inverted over the breast and the air exhausted from it by means of a pump (Fig. 208). The bell is applied several times a day for twenty minutes. The physician must be asked for accurate instructions regarding its use.

Galactorrhea, or Excess of Milk.—This is not a common condition, and when it occurs, is seldom persistent. After a few weeks the activity subsides to a normal that is sufficient for the infant. If the clothing is soiled by the constant leakage of milk, sufficient pads or a glass reservoir

shield should be placed to catch the overflow, and a snug breast-binder should be constantly worn. The patient should reduce the amount of water drunk and of starches eaten. The bowels should be moved daily by saline cathartics. The infant should be put to the breasts less often, and regularity is to be insisted on. Medicines are sometimes given to check the secretion of milk. These are belladonna and iodid of potassium. The nurse should watch for their physiologic effects, as some women have an idiosyncrasy for them.

Agalactia, or Scarcity of Milk.—This condition is much more common than galactorrhœa. It is little less than a calamity when a woman is unable to nurse her child. That a woman should refuse to nurse her infant when she has milk and is well is unpardonable.

Unfortunately, a large number of women cannot nurse, either because of ill health or because they have no milk. Many children die, either directly of the want of mother's milk, or indirectly of children's diseases to which they fall easy prey if they have been brought up by the bottle. The custom of giving children to wet-nurses or to others to be brought up on the bottle is an ancient one. Caesar reproached the Roman women for doing it and for squandering their affection on dogs and monkeys.

The writer has noticed a decided improvement among women in regard to nursing their children.

Causes.—The causes of deficient milk-supply are general weakness or ill-health, worry, lack of nourishment, a puny baby, malformation of the breasts or the nipples, and absence of gland tissue. In the last class of cases the breasts may be large with fat deposit. If there is no gland tissue, it is useless and dangerous to try to stimulate the secretion of milk.

Symptoms.—The symptoms of deficient milk-supply are: first, the distress of the child—its loss in weight; second, the pain in the breasts and the absence of secretion. The

child is unsatisfied with the nipple; he may suck for a short while, but, finding nothing there, will refuse it and cry. After supplemental feeding he goes to sleep. When there is plenty of milk, the mother can feel it leave the breast and see the infant swallow. There are also some drops of "white nourishment" around the mouth. These are all absent in agalactia. Weighing the child before and after nursing proves the functioning of the breast. If the mother persists in nursing after the supply has diminished, the act comes to be attended with pain in the breasts, radiating around to the back, first only during the nursing, later in the intervals also. Unless nursing is interrupted, serious inroads on the woman's health may result.

Treatment.—If there is not enough milk in the breasts an attempt may be made to stimulate the secretion by diet, cool baths, and massage of the breasts. Medicines have very uncertain, if any, action. Pituitrin has recently been tried, also placenta extract. The physician may prescribe a malt extract, somatose, or other preparation vaunted to stimulate the secretion. The author's experience with malt preparations is that they often fatten the patient and dry up the milk.

By increasing the liquids in the diet the total quantity of milk may sometimes, not always, be increased. When the milk-supply is not augmented, the patient puts on fat. The patient is given milk in large quantities, water, very weak tea, chocolate, oatmeal and barley gruels, and oyster-stews, in addition to her regular diet. The effect is not permanent, and too much water alters the metabolism. Aleoholic drinks should be restricted or, better, avoided, and certainly by a mercenary wet-nurse. Aleoholics are not good for the infant.

Cool full baths stimulate the skin and the breasts also. They may be taken daily and at about 80 to 84 F. The whole body should be briskly rubbed with a coarse towel, avoiding the mammae.

Bier's method of producing artificial engorgement has been applied to the breast to stimulate the flow of milk. Dr. Isaac A. Abt's breast-pump (Fig. 209) gives better results.

Massage of the breasts stimulates the formation of milk. When massaging the breasts for this purpose the rules given on pp. 421 and 423 do not apply. One wishes here to irri-

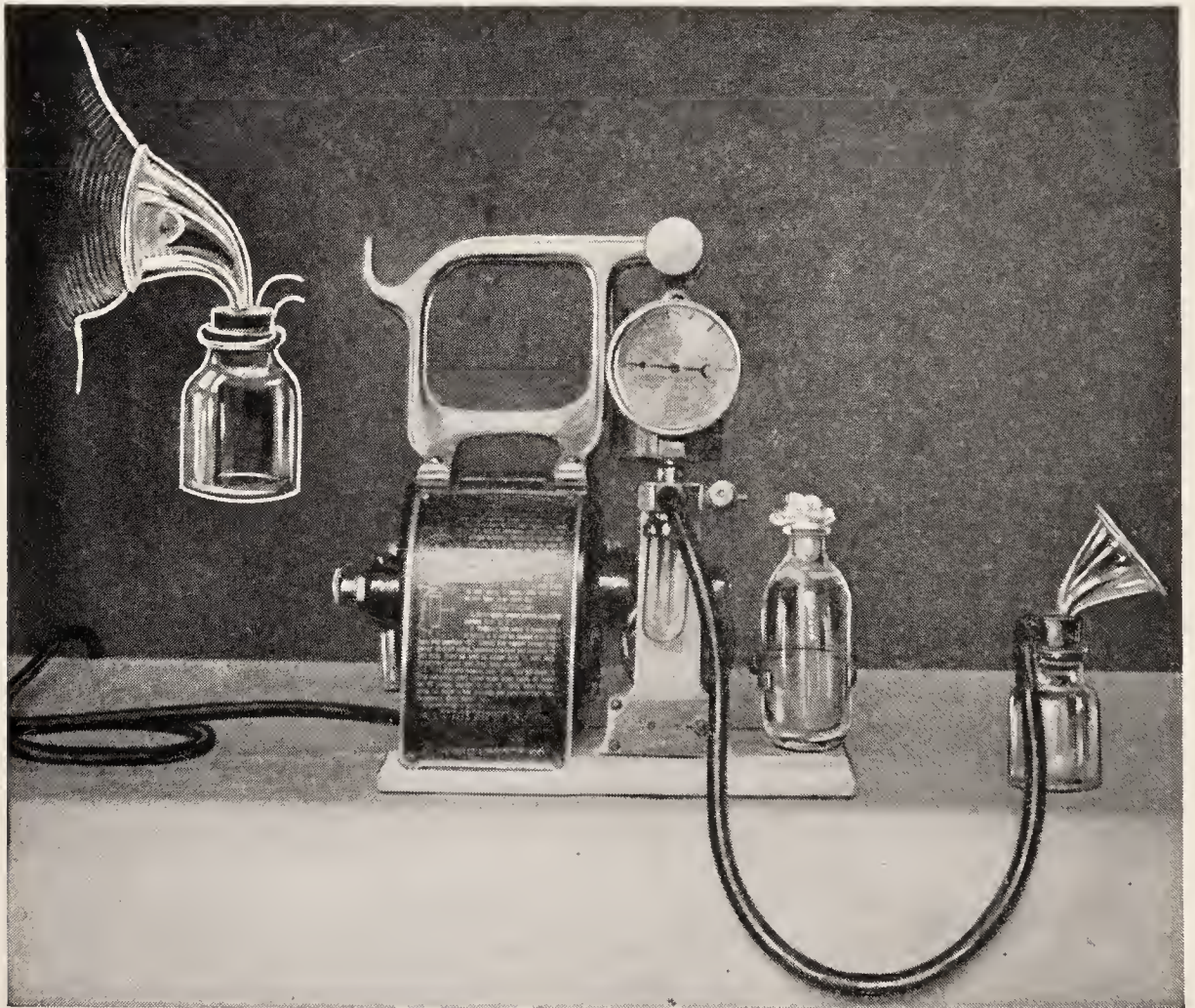


Fig. 209.—Dr. Isaac A. Abt's electric breast-pump.

tate the gland. This is done by raising the whole breast from the chest wall (Fig. 210) and working it gently between the fingers. Care should be used not to bruise the delicate organ, as an abscess may result. The gland is then held against one hand, while the tips of the outspread fingers of the other hand make circular movements all around its periphery (Fig. 211).

Electricity has been tried, with indifferent success. The best stimulant for the milk secretion is a vigorous infant.



Fig. 210.—Massage of breast to stimulate the flow of milk. First motion.



Fig. 211.—Massage of breast to stimulate the flow of milk. Second motion.

One should not be discouraged too soon, as the establishment of the milk secretion is sometimes slow. In one

case sufficient milk did not come until the fifth month. Often after the patient is up and gets out of doors the milk comes in larger quantities. One may be misled to believe that this is the action of some special drug or of feeding.

If, however, the measures instituted have no effect, it is wiser to discontinue them as soon as this fact is apparent. Too great zeal in forcing the breasts to act may result in mastitis. The milk secretion has been known to cease completely on a sudden fright experienced by the woman, and it has been observed that a quiet, placid life contributes to a normal and continued flow of milk.

Abnormal Milk.—Remarkable as it may seem, the milk of the mother, although plentiful, may not agree with the child. The writer has seen cases where it seemed to act like an irritant intestinal poison, and fatalities have even been reported. These cases have all been neurotic mothers, and most of them in the higher classes. Chemic and microscopic examinations have not given satisfactory explanations. The condition may or may not recur in the subsequent pregnancies.

The child will refuse the breast, in which case the milk may have a foreign taste, or it will vomit the ingested milk or have a diarrhea from it, sometimes with fever. The milk may appear yellower and thicker in these cases, showing either a persistence of the colostrum or an increase in fat and protein—that is, it is too rich. Curiously, sometimes a child will refuse one breast and accept the other; in a case of this kind the milk of one breast was said to be salty.

If the milk is believed to disagree with the child, causing green, acrid stools, the nursing should be discontinued for forty-eight hours, the breasts being regularly emptied in the meantime by the breast-pump. The child is fed on a substitute milk, and at the end of this period another trial is made of the mother's milk. If it again causes intestinal disturbance, the wisest course to pursue is to obtain a wet-nurse for the child.

If the mother's milk is deficient in one or the other ingredient, the physician will instruct the nurse to add this or that preparation of sugar, cream, barley-water, etc., to each feeding.

Drying Up the Milk.—When it is necessary to dry up the milk, the physician will usually instruct the nurse to bind the breasts up as tightly as the woman can tolerate it, to reduce the liquids in her diet, and to give her daily a saline cathartic. Before applying the binder the breasts should be emptied by a strong infant or breast-pump, and sterilized with soap and water and a bichlorid solution. The binder is not disturbed unless the physician wishes an ointment, of which belladonna is the favorite, applied. Systemic effects have been observed from belladonna ointment applied to the breasts (dilated pupils, rapid heart).

Experience has shown that it is better to leave the breasts entirely alone after the above treatment, and not to massage or pump them.

Care of a Wet-nurse.—If the mother cannot nurse her babe, a wet-nurse should be recommended. The family may not be able to employ one, or it may be impossible to obtain a suitable one, but the fact stands out that the best nourishment for a newborn babe is mother's milk, and no effort should be spared to provide the same. Only the two reasons given above ought to be allowed in the discussion of the engagement of a wet-nurse. The author is aware that a wet-nurse at all times is not an unalloyed blessing, and sometimes even an almost intolerable nuisance, but the family should be encouraged to bear with much for the sake of the infant. After a few months, when the child has gotten a good start, the wet-nurse may be dispensed with—if really necessary.

The physician will select the woman, and having satisfied himself that she is healthy, has no syphilitic or nervous disorders, is not tuberculous by all the tests and has good milk, will ask the nurse to look after her. The wet-nurse

on arrival should be received quietly, allowed to bathe, and should then rest a few hours in bed. This is to quiet the usual excitement and perhaps alarm occasioned by her new surroundings. The nurse can do much to make her feel at home. The first milk of the breast is pumped out, and, after the woman has rested, the child is allowed to nurse. The milk may be scanty for a day or so, probably because of the mental disturbance alluded to.

A wet-nurse should do light work about the house, and she must take exercise out-of-doors. The nurse takes care that she is cleanly about her person, her teeth perfect, that her bowels are kept in good order, and that she has sufficient sleep. Anything abnormal in these matters should be reported to the physician.

The diet is important. Let the woman have those things to which she has been accustomed. If a woman who is accustomed to brown bread, soup-meat, and potatoes is allowed to eat rich pastries, fried meats, and heavy sauces, she will put on fat and the milk will dry up. The cook is to be instructed not to allow the wet-nurse to eat indigestibles and acids, as these affect the milk. It is fatuous to try to keep the milk by plying the wet-nurse with beer, malt extracts, rich foods, liquids, etc. If the milk is increased in amount, the quality is bad. A change of wet-nurses is needed. Should the woman menstruate, there is apt to be some slight disturbance of the infant's bowels, but usually not sufficient to contraindicate nursing. All these precautions are particularly needed in the case of a premature infant. If plain living, with light household duties, a moderate amount of exercise out-of-doors, and a quiet, undisturbed life do not give a good milk-supply, another wet-nurse is to be selected.

CHAPTER V

THE DISORDERS OF THE FIRST WEEKS OF LIFE

THERE are many conditions which arise during the first weeks of life—some mild, some serious—which the nurse ought to know. She has often to diagnose them and report them to the physician. It is well that she be acquainted with some of the methods of treatment, although in the individual case she obtains directions from the physician.

AFFECTIONS OF THE DIGESTIVE ORGANS

Indigestion heads the list in frequency of disorders of digestion. The causes are: too frequent nursing, irregular feeding, letting the child drink too much or too fast, inappropriate food, especially common in artificially fed children, and exposure to cold. Overfeeding and overdrinking are very common. Indigestion is a symptom of intestinal infection or of food allergy.

The symptoms are restlessness, colic, vomiting, diarrhea, rumbling in the bowels (borborygmus), discharge of gas by mouth or rectum, and excoriations around the anus. The stools are green, acrid, foamy, and contain much mucus and clumps of undigested milk. There may be a little fever.

The treatment consists in removing the causes mentioned. The physician may prescribe bismuth or other remedies, beginning the treatment with 15 drops of castor oil. He may order food withheld for a short period, and barley- or rice-water substituted. The nurse regulates the hygiene of the infant, but gives neither drugs nor household remedies without instructions.

Colic is one of the symptoms of indigestion, although it may occur when the stomach and bowels are acting well. It is due to similar causes—errors in amount, quality, and time of the feedings. A bottle-fed baby almost never escapes many attacks of colic, and breast-fed infants not seldom suffer from it. It seems as though the intestinal canal requires time to adapt itself to the bacteria and food ingested. If the child is not kept warm, it is likely to suffer from colic.

Symptoms of colic are: crying, with drawing up of the feet; often the child is awakened from sleep by colic, when it emits a short, sharp cry; rumbling in the bowels and passage of gas by the rectum, whereupon the colic ceases; finally the symptoms of indigestion, if this is causative.

The treatment of the colic should begin with the removal of the cause—that is, regulation of the diet, a cathartic for constipation, and warm clothing, especially about the feet and abdomen. Household remedies in great numbers are given by nurses, but it is better to avoid them and get orders from the physician. If the nurse is alone, she may give the child a salt solution colonic flushing. Then it is laid prone on a warm-water bag for a while or cuddled up warmly against the nurse's breast. A drink of hot water, plain or with a few drops of essence of peppermint, is given. The nurse must not give a child whisky, paregoric, or other drug without express permission. The writer found a case where the nurse had been giving a babe *crème de menthe* until the little one was a toper.

Gastric lavage is sometimes ordered for colicky babies, as well as many medicines, of which calomel and the aromatics are the commonest. Opium is used with great circumspection in infants.

Difficulty in Nursing.—The causes of difficulty in nursing are: ignorance, the babe must learn to suck; tongue-tie, cleft palate, and hare-lip; occlusion of the nasal

passages, impending breathing; sore mouth, as thrush and Bednar's aphthae; diseases of the lung, as pneumonia, bronchitis, atelectasis; diseases of the brain, causing apathy and coma; prematurity, the infant feels no hunger and may "sleep away." A child that has become accustomed to the easy way of obtaining milk from a bottle may refuse to work at the breast. The breast itself may be at fault; the nipples may be too small or depressed; the gland may be so engorged that the babe cannot take hold; the milk may not agree, having perhaps a foreign taste; or there may be no milk there.

With the cause the nurse will have the remedy.

Vomiting.—This is a symptom of many diseases, but principally of indigestion and gastro-enteritis. Infants normally vomit in the first weeks, and it may be due to overfilling of the stomach or to the fact that the stomach is situated favorably for regurgitation at this tender age. Only when the vomiting is persistent and attended with evident nausea or contains bile, blood, etc., is the symptom significant. There may be a **pyloric stenosis** or mechanical occlusion of the lower gut, in which case constipation will accompany the emesis. The treatment of vomiting is *nil* unless there is a real sickness behind it. The child may nurse a little shorter period than fifteen minutes, and should be handled carefully afterward. If the child should vomit blood, bile, or anything but milk, the nurse must notify the doctor at once.

Constipation.—Newborn infants are seldom costive, although in later months this is not uncommon. In the first days the bowels may not move because a plug of tough mucus has accumulated in the rectum. After this is gotten rid of the evacuations occur normally. In the first days, too, the bowels may not move because the anus is absent. This is a very serious condition, and requires operation; it should be reported to the physician without

delay. In these cases the infant soon commences to vomit, but the general health is interfered with only late. Constipation may be due to insufficient food, to a lack of water, and to habit.

The treatment consists of: first, regulation of the diet, colonic flushings, the use of castor oil or other laxative; later, massage. Glycerin and soap suppositories are not recommended. Gluten suppositories and oil enemata may be used as in the adult. After the cord is off and the navel healed, light abdominal massage is practiced. Cathartics may be given the mother to act on the child through the milk.

Diarrhea.—This is much more frequent in the first weeks than constipation, and is more difficult to cure. The ingestion of the colostrum causes a physiologic diarrhea, it being evidently nature's object to get rid of the meconium in this way as soon as possible after birth. The writer has found that children do better if this tarry material is early gotten rid of, and, therefore, prescribes for all babies 10 drops of castor oil on the second day. If the milk is too rich in fats or proteins the infant may have a diarrhea, and if the mother is taking laxatives the child feels their effects.

Often diarrhea is caused by gastro-intestinal infection, and then is usually attended by fever. Occasionally the infant has frequent watery movements of a yellow color and normal odor, and does not apparently suffer. This looseness of the bowels is not serious, simply being due to indigestion, which will get well if the child is made to nurse more slowly, and if the milk is diluted a little—for example, by giving some barley-water before the nursing. Two casein preparations are occasionally used, Casec and Protolac. Often the condition of the bowels will not be satisfactory until the mother is up and out-of-doors. This seems to regulate the function of the mammary glands.

Green Stools.—The nurse should inspect and note the character of the child's evacuations. If they are abnormal, the doctor ought to know it. Normally the stools are dark green for two days, then brownish, then with the addition of yellow, and soon all golden yellow.

If the meconium is a long time in coming away, castor oil should be given to clear the intestinal tract, as this material is prone to decompose. If the child does not obtain enough food, the stools are scanty and brownish until the deficiency is supplied.

The stools should be semisolid, and the water margin around the solid part should be about $\frac{1}{2}$ inch wide. There should be no lumps or curds; the odor is that of sour milk—not offensive. There is very little mucus—not enough to give a glossy appearance—and the movement should not be frothy. If the stools are green, slimy, frothy, and full of whitish lumps, the child has indigestion. If the stools are, in addition, sharp, with a strong odor, and if the child has fever, an inflammation in the gastro-intestinal tract is present. In these cases the movements are so sharp and acrid that the buttocks and perineum of the infant are eroded, even ulcerated. Such stools and such ulcerations are decidedly more common with bottle-fed infants. The nurse, in treating a case of this kind, after following the physician's orders, may seek to improve the condition of the mother by providing mental quiet, good air and food, and regularity of feeding and nursing the baby.

Occasionally calomel is given, but usually the baby's diet is corrected to cure green stools.

If blood appears in the stools the case is called **melena neonatorum**. The blood, unless in large amounts, is dark, almost black. The red color comes out if the napkin is wet with water. The nurse will notify the physician at once, as the condition is serious.

Inanition Fever.—In the first days, before the milk comes, the infant may have a sudden rise of temperature—

sometimes as high as 105 F., usually not over 103 F. In marked cases there are severe cerebral symptoms, even convulsions. The writer is very skeptical about these cases being due to starvation or thirst, but thinks that, more likely, they are due to intestinal putrefaction, or infection some place, *e. g.*, mouth, throat, pyelitis, navel, etc. Treatment consists of giving 15 drops of castor oil, a saline solution colonic flushing, much water to drink, and mother's milk. Cool bathing for the fever or an ice-bag to the head may be needed should cerebral symptoms develop.

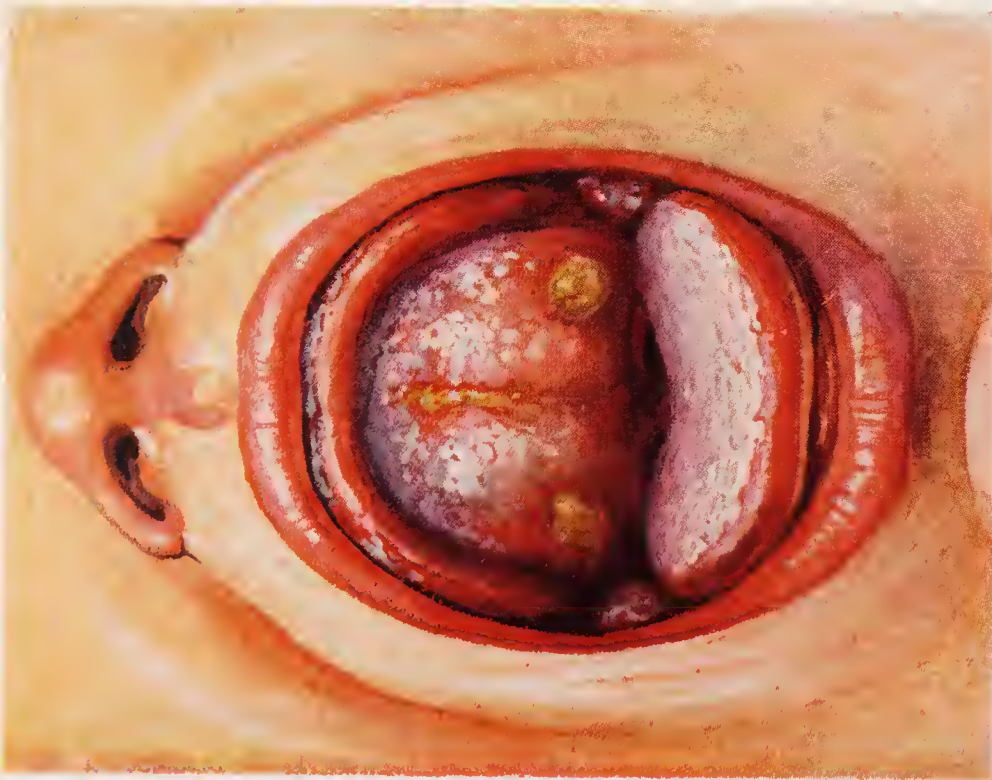
Thrush or Sprue.—This is an affection of the mouth, due to the growth of a vegetable fungus on the mucous membrane. The fungus is called *Saccharomyces albicans* or *Monilia albicans*, and may readily be seen under the microscope. The tongue, gums, and inside of the cheeks are covered with a whitish pellicle, in spots or larger plaques, which cannot be as easily wiped off as can milk, but when rubbed hard leaves a bleeding surface.

Thrush is due to uncleanness. It may be favored by poor health, and, therefore, is commoner in weak, sickly, and premature infants, but it is always due to neglect of the mouth, and should not occur. In weak and premature infants thrush, by interfering with the nourishment, and in rare cases by growing down into the stomach, may be the direct cause of death.

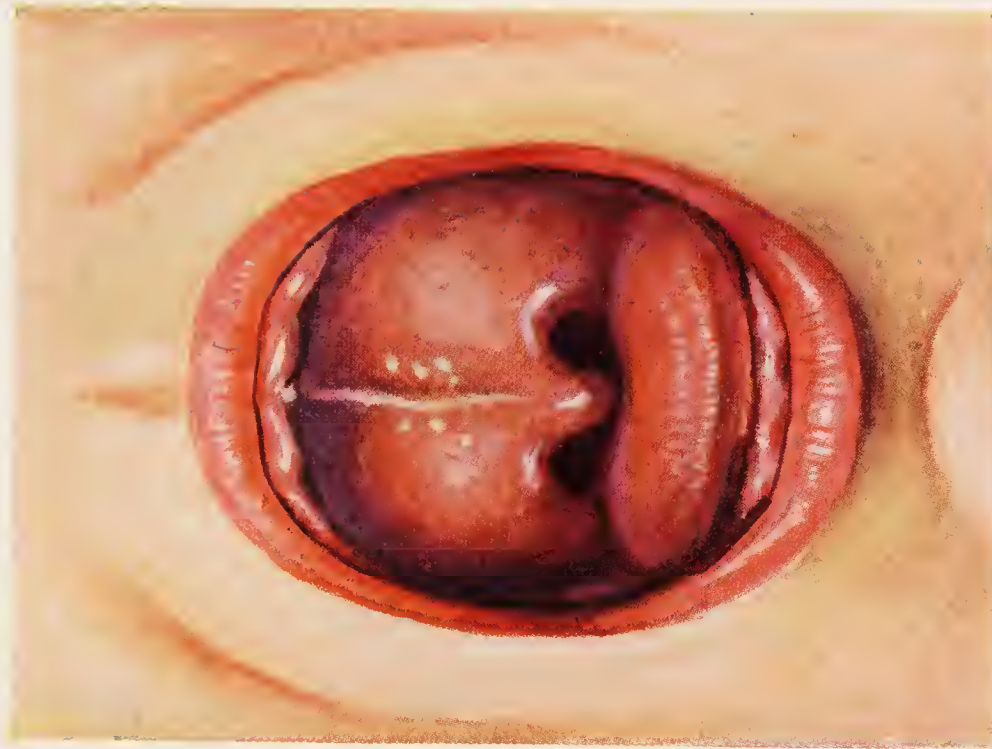
The treatment requires persistence and care, especially in premature infants. A simple method of cure is to paint the surfaces once or twice a day with a 1 per cent solution of gentian violet in water. Rarely this fails—then one application of 2 per cent nitrate of silver should be tried. Care is necessary to avoid hurting the delicate mouth.

Bednar's Aphthae.—Far back in the mouth, where the lower jaw is connected with the upper jaw and where the cheek runs into the pharynx, a ligament is stretched. Over this ligament the mucous membrane is very thin, and in

PLATE III



Thrush of mouth. The round ulcers at the sides are Bednar's aphthae.



The white specks are Bohn's nodules (little retention cysts).

appearance white. If the nurse, when cleaning the mouth, rubs too hard at the back of the cheek, she will rub off the delicate epithelium over the ligament mentioned and produce a superficial ulcer—perhaps one on each side. These ulcers, called Bednar's aphthae, (Plate III) interfere with nursing because they are painful, and they may lead to infection, with fever and serious illness. Prophylactically, the nurse will use only the gentlest touch in cleansing the

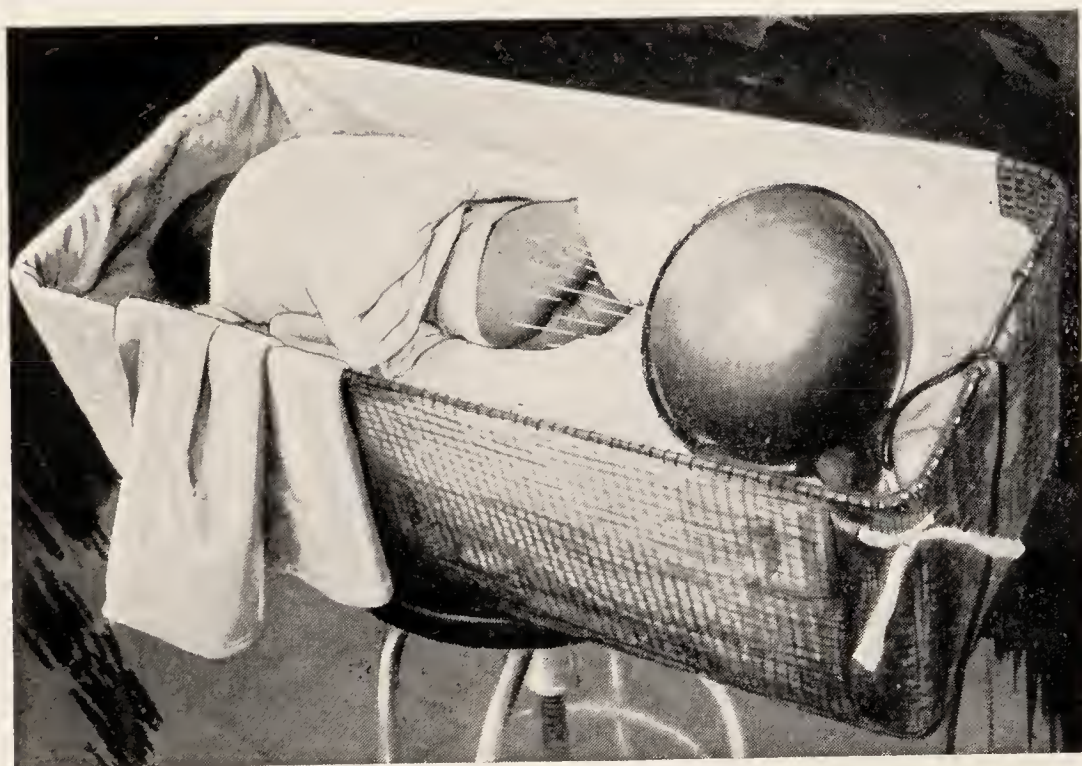


Fig. 212.—Treatment of sore buttocks by exposure to light. N. B. Tie the lamp securely so that it cannot fall and burn the baby. Cover the baby's feet also securely.

mouth. A daily application of 2 per cent nitrate of silver to the ulcer is a very efficient remedy. On the roof of the mouth one occasionally sees a few whitish masses—Bohn's nodules (Plate III). They are retention cysts. No treatment, but don't scratch them as infection may set in.

Sore Buttocks.—Redness and excoriation of the skin around the anus and on the nates may be due to irritating stools from intestinal disorders, syphilis, poor nursing (the diapers being unclean and changed too seldom, rough

rubbing), etc. With the cause the nurse will know the treatment. The doctor may prescribe soothing ointments, abstention from use of water, etc. We have had good results by exposing the buttocks to the electric lamp (Fig. 212) thirty to sixty minutes b. i. d. Erysipelas sometimes starts from sore buttocks.

Marasmus.—This term is used to designate those cases of simple but obstinate wasting in infants. Pronounced cases of marasmus do not occur as early as the period with which we are dealing, but among premature infants marasmus is one of the greatest dangers. The autopsies on children dead of marasmus show very little that is characteristic, yet the main symptom of the disease, excessive and continual wasting of the whole body, shows that the whole organism is profoundly affected.

The disease is due to errors of nourishment, with perhaps lack of vitamins, and therefore occurs almost invariably in bottle-fed infants. It seems that such children cannot thrive on anything but the natural food, and will waste away and die in spite of the best care and most expert preparation of other foods. It must also be borne in mind that when an infant has actually begun to be marantic from improper nourishment, it may be difficult or impossible to get it to assimilate even mother's milk. There is a strong hint in this fact—not to waste too much time in trying various foods, but if not speedily successful in getting suitable nourishment, to provide mother's milk at any cost.

The symptoms of marasmus are those of simple wasting: loss of weight, until the little body is almost skin and bone, protuberant belly, loss of appetite, indigestion, and extreme susceptibility to all diseases, which take on a very fatal character.

Treatment may be summed up as follows: mother's milk, proper diet, with vitamins (cod-liver oil, orange juice), and fresh air with much sunlight (quartz lamp).

AFFECTIONS OF THE RESPIRATORY TRACT

Fortunately, newborn infants seldom suffer with severe pneumonia, bronchitis, etc., but a child may easily take cold unless proper care is observed, and, once started, a catarrh is not easy to cure.

Snuffles is usually due to a slight rhinitis of innocent nature, but it may be due to a constitutional taint (syphilis), and the symptom should at once be reported to the physician. If it is attended with a skin eruption, a blood disease is all the more probable. Isolate the baby.

For a simple **coryza**, a little warmed oil placed in the nostrils and rubbing the bridge of the nose with camphorated oil are sufficient. The condition disappears in a few days. Care is indicated in order to prevent the inflammation from going down into the lungs. The infant should be kept warm and not be allowed to get chilled when being changed or oiled. The bath had better be omitted for a few days.

Bronchitis and Pneumonia.—In young infants inflammation of the bronchial tubes is a serious matter, because pneumonia is so prone to develop. The causes are usually infection by the air or by aspirating infectious vaginal secretions during delivery. Children delivered by operations are much more likely to develop pneumonia. A common cold in the mother or nurse, or a visitor may be a menace to the child. Treatment is entirely symptomatic. The physician may order stimulants, of which carbonate of ammonia is a favorite. Oxygen may be employed. Narcotics are usually rejected as dangerous. The wet-pack is the best means of reducing temperature. The nurse wrings a soft diaper out of water at a temperature specified by the physician—usually from 95 to 100 F.—and wraps it loosely around the chest. Over it comes one layer of soft flannel. This pack remains in place two hours, when it may be renewed. The cool bath may also be used to reduce temperature. The water should be 100 F. at

the start, and be reduced to 94 F. while the infant is immersed. The bath should not last over five minutes. While in the bath the child must be watched for symptoms of shock. If weakened at all, a little whisky on the tongue and a warm-water bag are needed. The mainstay in the treatment is mother's milk. Without it few children recover. The child must be held in the arms a great deal, and its position frequently changed—this to prevent the blood from stagnating in the lungs. The air in the room must be warm, moist, and fresh. Only good nursing will save these little sufferers. Isolate baby.

Cyanosis, or Blue Babies.—When a child is born with congenital heart disease, or when the wall between the two sides of the heart does not close fully, the blood is not completely oxygenated in the lungs, and the skin of the infant remains bluish or cyanotic. The hands and feet are cold. This disease has been called *morbus caeruleus*. These children may grow, but they die young, being extremely susceptible to outward influences, as overexertion, indigestion, the eruptive fevers, etc. Occasionally apparent recovery occurs.

There is a condition in newborn infants, more common in cases of prematurity, where the lungs do not unfold and expand as they should. This is called **atelectasis** and is very fatal. The children are blue, as the ones just described, but the condition is more quickly mortal. In either case if the child survives it becomes a narrow-chested weakling.

Treatment is tonic in both conditions, and later on systematic efforts are to be made to develop the chest by graduated muscular exercise and by all kinds of athletic sports to strengthen the heart. These must be taken under the control of a physician, to avoid overdoing it. Injurious influences should be held from the growing child, such as violent exercise, violent emotions, excess in diet, and extreme heat and cold.

AFFECTIONS OF THE URINARY ORGANS

Delayed Urination.—The nurse may notice that the infant does not urinate for a day or so after delivery, and inspection of the parts gives no reason for it. This delay is more common after operative deliveries, when the child has fever or jaundice, in the children of primiparae, and in premature infants. If the parts are normal no alarm need be felt. The babe sometimes passes water in the bath, and since the urine is colorless, this is not



Fig. 213.—Glass urinal for collecting urine from girl babies.

observed, or the stain on the diaper is likewise not seen. The physician may order a diuretic medicine, as sweet spirit of niter (*spiritus aetheris nitrosi*), and ask the nurse to give the child a great deal of warm water to drink. As aids may be used a moist warm dressing around the pelvis and warm stupes to the abdomen and kidneys. A warm sitz-bath may be given. The catheter is rarely required. If the anuria is prolonged, the physician may pass the catheter to assure himself that the passage is free. Spontaneous cure is the rule.

Collecting urine from babies for examination is not difficult in boys: a small sterile test-tube is fastened over the penis by means of adhesive plaster. In girls a little glass urinal is used (Fig. 213).

Uric Acid.—The napkins of the newborn are not infrequently found to be stained with urine containing little reddish or brownish crystals. These are composed of uric acid or of urates, and indicate that the urine is concentrated. These salts are occasionally found deposited in the kidneys. A free flow of urine washes them out on to the napkin. The child may cry with a little pain as the sharp crystals are passing. The symptom is similar in cause and significance to the anuria just considered, and requires the same treatment.

Phimosis.—In boys the orifice of the prepuce is sometimes so small that the urine cannot readily escape, causing the infant pain and difficulty in urination. There is actual danger in this condition, because, since the skin cannot be retracted, the secretions decompose underneath and serious inflammation may result. The physician may dilate the preputial opening, he may incise it so as to allow the retraction of the skin, or he may perform the operation of circumcision.

Circumcision.—This little operation is of great antiquity and wide distribution, having been in vogue for thousands of years among the ancient Egyptians, Arabians, Chinese, Hindoos, Africans, Aztecs, and Australians. It is still practised in many parts of the world as a religious or connubial rite and in the United States is slowly gaining recognition as a valuable measure of preventive hygiene. The majority of urologists are strongly in favor of its routine practice, one American writer even declaring that if circumcision were universal there would be 40,000 less deaths in this country each year. Among Orthodox Jews it is performed by an ordained circumciser called a "mohel," and it is a quaint ceremony, unfortunately sometimes followed by infection of the wound or hemorrhage, both of which may be fatal.

Jaundiced babies have a tendency to bleed, and before operating on such a child the doctor may want the clotting

and bleeding time of its blood tested. He may postpone the operation if a bleeding tendency is disclosed. He may do likewise if there are pustular eruptions on the baby's body, if the navel is not perfectly clean, and if the child has not yet regained his birth weight.

The nurse will make the usual preparations for minor surgery. A glass hypodermic syringe and a tiny needle, scissors, rat-toothed forceps, a few artery clamps, two fine conjunctiva needles with holder, a grooved director, and a probe are boiled. Stitches of 000 catgut may or may not be used.

It is cruel to subject the helpless tiny patient to unnecessary pain. Mild anesthetics are used. A bit of cotton is wrapped in the corner of a thin handkerchief, tied with a thread and soaked in whisky toddy (whisky 1 part, sugar-water 4 parts). The child sucks this for ten minutes before and during the operation. In addition, 2 drams of 1 per cent novocaine solution are prepared and used for local anesthesia; mereurochrome for skin disinfection.

The infant is wrapped warmly and laid on its back, with the thighs flexed on the belly, and held by the nurse with hands covered by a sterile towel. The child must be held firmly, because, though simple, the operation is delicate. The basin of hand solution and instruments are arranged conveniently as shown in Fig. 214.

At the Chicago Lying-in Hospital the little board shown in Fig. 215 has been found very serviceable.

The first dressing, which may be moist or dry, according to individual operators, should be left on three or four days. The nurse must watch carefully for secondary hemorrhage. If the dressing is soiled by feces it should be changed, after being loosened by soaking with sterile water. The part is kept covered with sterile vaselin. Care should be taken to allow no gauze to adhere to the glans, and the diaper must be arranged so as to exert no compression.



Fig. 214.—Infant prepared for circumcision. Nurse stands on the left. On the right is a euchre table, protected with newspaper and sterile towel, holding basin of weak antiseptic solution and the instruments. The nurse's hands are covered by a sterile towel. Scissors, rat-tooth forceps, artery clamps, needle-holder, 2 fine needles, probe, 000 catgut. The field is swabbed with 4 per cent mercurochrome.

Should there be secondary hemorrhage, the nurse should wrap the organ tightly with gauze and notify the physician at once. Until he arrives the nurse can exert constant circular compression and thus prevent serious loss of blood. Healing takes place in from one to seven days, depending on the asepsis practised at operation, and the

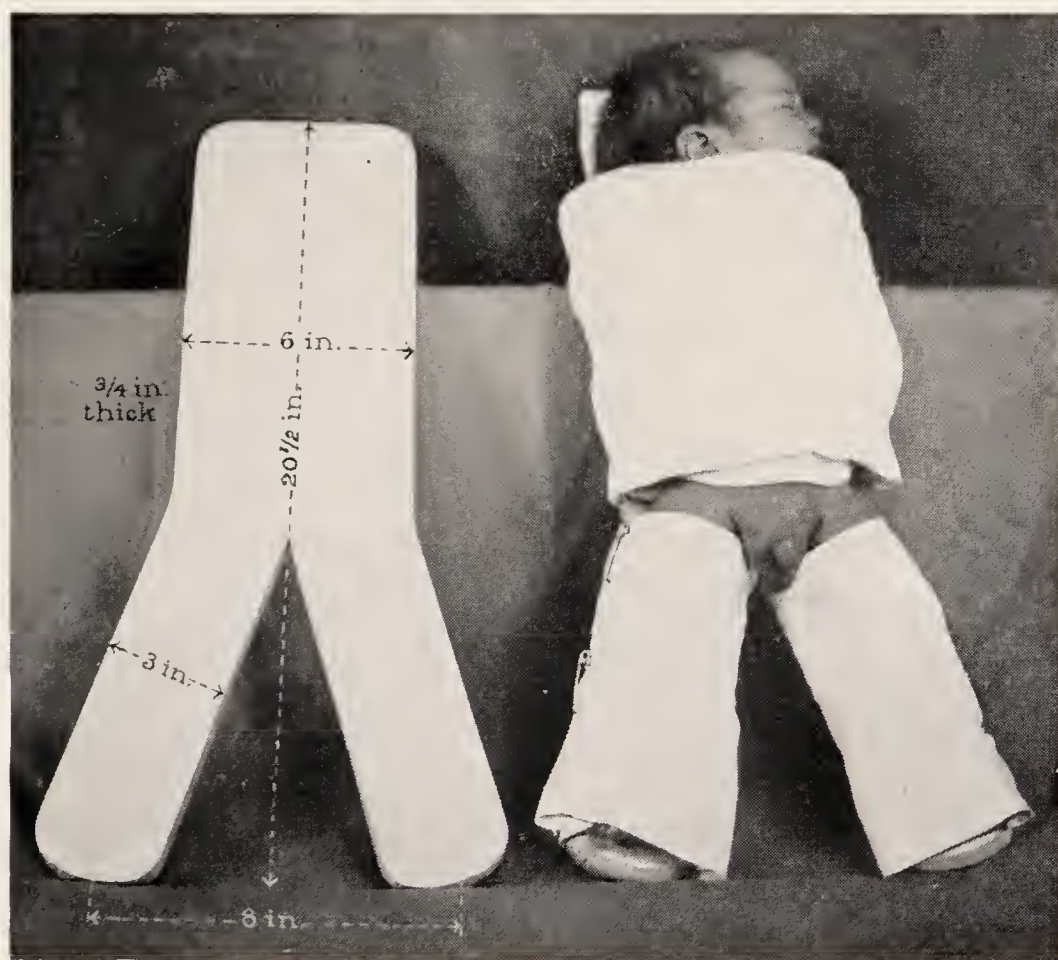


Fig. 215.—Circumcision board as used at the Chicago Lying-in Hospital.

child may be peevish and fretful until the source of irritation has disappeared. The nurse should take pains to see if the edge of the skin adheres to the glans, and, if it does, she may, after the third day, gently pull it away. Vaseline is again applied to prevent new adhesions.

Dilatation.—Some physicians make a routine practice of dilating the prepuce and drawing it behind the glans as a part of the daily toilet of the child. It may be necessary first to incise the edge of the orifice before the skin will go

back. After the first retraction the nurse will be instructed to carry out the procedure. This is done by slowly slipping the skin back toward the pubis until the whole glans is exposed. Smegma is now cleaned off with vaselin, and the skin brought forward again. A lubricant is always applied.

AFFECTIONS OF THE SKIN

Jaundice.—A yellowish discoloration of the skin in newborn infants, called *icterus neonatorum*, in milder or severer gradations, is present in fully 25 per cent of cases. It appears from the third to the sixth day, and affects the whole body. There are several theories as to its cause, as disorganization of the blood, inefficiency of the liver, causing an accumulation of bile in the blood, sepsis, etc. The writer believes that the worst forms are due to sepsis or congenital stenosis of the bile-ducts.

In the milder cases the child is unaffected, but when the skin is very yellow, especially if the whites of the eyes are icteric, the general health of the infant suffers. In some cases even the secretions from the nose, eyes, and other orifices are yellow. The bowels are usually out of order, and the infant gains slowly. The physician may prescribe medicines, but the nurse's duties will consist in providing sufficient and adapted nourishment for the child, and giving colonic flushings to clear the bowel and to stimulate excretion of the bile by way of the kidneys and skin. The mother should be assured that the jaundice will fully disappear. Since icteric babies bleed readily, operations (circumcision) are usually postponed.

Eruptions on the Skin.—The skin of newborn babies is not always clear and smooth at birth. The writer has seen infants born with blisters from pin-head to finger-nail size and with raised eruptions of various kinds. The skin of some infants desquamates completely after birth, the epithelium coming off in large or small flakes. The epithelium may loosen in the palms of the hands in a large piece,

and the nurse will need to use care in removing it. Erythema is not uncommon.

Later the skin may desquamate as the result of fevers, or from intestinal disorders or toxemia, and the scaling much resembles that of scarlatina.

Infected hangnails on fingers and toes, especially common in hospitals where there are so many bacterial contacts may give rise to serious trouble. Much may be done preventively by touching the fingers and toes with 5 per cent ammoniated mercury ointment every morning.

Vesicular Eruptions.—Tiny water-blisters on a red base, occurring closely set around the forehead, neck, and in the body folds, are due to sweating and to too warm clothing, or to a tender skin after the use of water or soap and water. This is popularly called “red gum.” If there is no redness around the vesicles, the term “white gum” is applied. The scientific name for the affection is strophulus (this has nothing to do with scrofula) or miliaria. Prickly heat is the same affection, but in an aggravated form, with inflammation around the vesicles.

All three are caused by the sweat-glands being occluded, allowing the sweat to accumulate under the closed openings of the glands in the skin. They all give the infant more or less discomfort, but most distress comes from prickly heat.

Sometimes the blisters run together and form blebs, or they may become pustular, when the case is not simple, as above described, but belongs to a class of skin infections some of which are serious and contagious, *e. g.*, **pemphigus** and **impetigo contagiosa**.

An eruption of irregular, reddish-brown spots with uneven borders, fading to a copper color, is strongly suggestive of blood taint in the infant. If with this the child has snuffles, and if the region around the anus is reddened, eroded, and cracked, the suspicion of syphilis is grounded (Plate IV). The nurse must exercise constant care that she does not infect herself and that she protects the other infants.

Chafing, or Eczema Intertrigo.—In fat babies the skin in the folds is likely to macerate and become irritated. A watery exudation occurs, which may decompose and cause little abscesses. This is especially common in bottle-fed infants.

TREATMENT

The treatment of all these affections, except that of constitutional eruptions, is based on the principles of absolute cleanliness and dryness of the affected skin and the non-transportation of infection from one part of the body to another.

For the heat-rashes the child should be dressed in the lightest clothes, and on hot days left partly undressed, out of the way of drafts, for short periods during the greatest heat. The bath may be employed without soap, and the skin thoroughly dried without friction. The cloth is laid on the skin and the fingers are rubbed over it. Then a non-antiseptic dusting powder is applied to the affected parts. Finest powdered rice starch is very good. Those containing boric acid should not be used. Boric acid powder irritates the skin. For the intertrigo the same treatment is employed, and the folds are kept apart with a thin layer of cotton or old linen, which is frequently changed. In some cases water acts as a direct irritant and must be discontinued; this should always be done if the affection proves rebellious to treatment. Any other measure will be ordered by the physician. All eruptions should be noted on the record-sheet and shown to the physician.

It must be remembered that insect-bites, irritating dye-stuffs, or insufficiently washed clothes may cause eruptions on the delicate skin of newborn babes.

Pemphigus (often named **impetigo**) is a skin affection which has been more or less generalized all over the country during the past few years, but has been most prevalent in hospitals. Many had to be closed because of it, since, though it is usually a harmless eruption, sometimes the blisters cover the body, cause sepsis and death.

PLATE IV



Syphilitic child—Part of face.



Syphilitic child
Anal region.



Osteochondritis syphilitica
Section of femur.



Syphilitic child—Foot.

Flat blisters suddenly appear on various parts of the child's body, usually on those exposed to maceration and friction—the axillae, the neck, the groins. They vary in size from a split pea to a nickel, contain a thin yellowish serum, break very soon, but do not form crusts. The disease is highly infectious and contagious, and, once it appears in a nursery, it is gotten rid of only with the greatest difficulty.

It is caused by the *Staphylococcus aureus*—sometimes by the *albus*. The germs are inoculated on to the skin from a suppurating navel, from the lochia, or other focus of infection, or a case of pemphigus is introduced into the nursery. The contagium is then disseminated by carriers. These may be the nurse, the doctor, the circumcisor, the bedclothing, the weighing scale, the bath-tub, the air—in short, by any one of the numerous avenues through which contagion spreads in a hospital. In rare cases babies are born with blebs containing staphylococci.

Treatment.—We have found the following the most successful in preventing epidemics and in curing the individual case: (*a*) Minute individualization of the babies in the nursery so that infection is not carried from one to the other. (See p. 224.) (*b*) Frequent inspection of the child so as to discover the first blister, which inspection is redoubled when it is known pemphigus is around. (*c*) Absolute isolation of the infected baby, in a separate building if possible. (*d*) As soon as discovered the blisters are wiped off with 50 per cent tincture of iodine in alcohol, or with 95 per cent alcohol, and the raw skin painted with 5 per cent nitrate of silver solution. Some pediatricians prefer dusting powders, *e. g.*, bismuth, calomel, zinc stearate and rice starch in the proportion 1:1:4:4. (*e*) The child's whole body is exposed to dry air constantly, stark naked, but protected from drafts. In summer the child lies outdoors in the shade, but is exposed to direct sunlight for five minutes at a time *q. i. d.* In winter the exposure to the sun takes place indoors. On cloudy days the ordinary electric light is used with similar dosage, the child being exposed in the Nobel box (Fig. 230) but the quartz lamp is the best. (*f*) Use every effort not to carry the infection to healthy parts of the baby's body. In some hospitals every newborn baby is oiled once with 5 per cent ammoniated mercury ointment as a prophylactic. One might try this in the presence of an epidemic.

If an epidemic occurs in a nursery only the most drastic measures can suppress it. First remove all the well babies to another room for observation and provide a new nursery for new babies; after the last pemphigus case has gone home, the infected quarters are thoroughly disinfected—see p. 575; all the linen used on and around the babies is autoclaved after it comes from the laundry; special nurses take care

of the infected babies and everyone handling the babies wears cap, mouthcover, and gown—and the hands are doubly washed between dressings—gloves are better; extreme individualization of each baby must be practiced during epidemics, the bath table being omitted and the babies treated in their cribs; overcrowding must be avoided, and every connection with the general hospital wards shut off.

OTHER AFFECTIONS OF THE NEWBORN INFANT

Enlargement of the Breasts.—A few days after birth the nurse may notice that the breasts of the infant are enlarged. They may contain milk, which the old German midwives called “Hexenmilch,” or witches’ milk. This engorgement of the breasts disappears untreated. If the nurse rubs the surface ungently or tries to squeeze the milk out, she may bruise the delicate organ and cause an abscess. In girls this is a very serious matter, as the gland is thus destroyed and the function of nursing rendered impossible.

Treatment.—The breasts are bathed, carefully anointed with camphorated oil, padded lightly with cotton, and a smooth little breast-binder is applied and sewed on. This lies undisturbed for five days, when the engorgement will have disappeared. During the necessary handling of the infant the fact of the breasts being engorged should be borne in mind and the region not touched.

If an abscess forms, which is quite unusual under this treatment, it should be opened speedily to prevent complete destruction of the gland. The physician, therefore, ought to be apprised daily of the condition of the infant.

Vulvitis.—In female infants a moderate inflammation of the vulva may exist, and there may be considerable mucous discharge. No treatment save cleanliness, care to avoid injury, and the application of albolene is necessary.

Menstruation.—Once in about 50 cases of female infants a bloody, apparently menstrual, discharge appears on the napkin. In one case it was so profuse that the little one’s health was affected. She was listless and limp for a

few days. The bloody discharge almost never means anything pathologic, but it may, and should, therefore, be promptly reported. Treatment is usually unnecessary. In the case cited 1 drop of ergot was given three times.

Delayed Separation of the Cord.—In puny children and in cases where the cord was large and thick, or where a hemorrhage occurred near its insertion, the process of gangrene and separation of the cord is very slow and may be delayed beyond two weeks.

The falling of the cord may be hastened by simple means. A little collar of cotton is made and saturated with 95 per cent alcohol and placed around the base of the stump, which is then dressed as usual. Another method is to paint the stump and its insertion with 2 per cent nitrate of silver. Only in rarest cases is it necessary to snip the remaining strands of tissue with scissors (aseptic).

Granulations of the Navel.—These sometimes form and cause a continual watery discharge, at times bloody, from the depressed surface. To cure them early wiping with 2 per cent nitrate of silver suffices; later they may have to be ligated and cut off. They are called sarcomphalus.

INFECTIONS OF THE NEWBORN

A child is sometimes infected before it leaves the womb by bacteria floating in the blood of the mother, but for practical purposes we consider the infant, when born, sterile. Being an aseptic medium, it is at once attacked by germs from all sides. These germs gain entrance through the mouth, the eyes, the navel, the vulva, and any accidental wound.

The little one is very susceptible to infection, and if these germs are at all virulent, they may overcome the slight resistance it offers.

The duty of the nurse, therefore, is mainly to prevent

infection of the newborn. The principle of this prevention is: asepsis of all things coming in contact with the eyes, the mouth, the navel, the genitals, and accidental wounds. Of course, those surfaces exposed to air will be contaminated by air-infection, but in private practice this danger is minimal, although in general hospitals, where pus is present, it must always be considered. The fingers of the nurse may be soiled by lochial discharges or from handling bed-pans or other non-sterile articles, and without proper disinfection she may dress the navel or wash the mouth. The clothes of the infant may have been mixed with infected linen, the rubber nipples and other utensils used by the infant when feeding may not have been boiled, the milk may be impure—indeed, the sources of infection are innumerable.

Infection of the Umbilicus.—The stump of the cord separates in two ways—by dry and by moist gangrene. Dry gangrene is the normal method. Moist gangrene is the quicker, but more dangerous, and is abnormal. Infection of the stump and at the line of union of the stump and abdomen shows itself by redness, edema, swelling of the skin, and an unhealthy appearance under the edge of the cord, even to the presence of a few drops of pus. There may be an odor to the cord, and the child may have fever, which may reach 103 F. In severer cases the navel may ulcerate, or an inflammation may extend more or less over the belly, or the infection travels along the vessels inside the abdomen until the liver is involved, and general, fatal blood-poisoning results. The importance of asepsis of the navel may, therefore, be appreciated by the nurse. If there are any signs of inflammation about the navel, the nurse will report it to the physician. He may make tiny incisions into the inflamed area for drainage, and then apply a wet, weak, antiseptic dressing—50 per cent alcohol is sometimes used. Should the cord become moist, with an appreciable odor, the nurse must correct the condition early, as it may lead to graver infection. The stump is wrapped in

PLATE V



Normally healing umbilicus.
Third day.



The cord stump has dropped
off, the base is covered with pink
granulations, now being covered
with epithelium.



Infected umbilicus. Fourth
day. Note, area of swelling and
redness, the pus and the moist
stump of cord.

cotton, saturated with 50 per cent alcohol, and then dressed as usual. Every eight hours this dressing is renewed, and three dressings will ordinarily suffice. Antiseptic powders, as boric acid, salicylic acid, scarlet red, and starch, are occasionally employed. (See Plate V.)

Infection of the Eyes, or Ophthalmia Neonatorum.

Ophthalmia neonatorum is an acute purulent inflammation of the mucous membrane of the eyes of the newborn.



Fig. 216.—Diplococcus of Neisser, the gonorrhea germ, taken from the pus of the eye. The little double dots are gonococci, the large masses are pus-cells.

“Sore eyes” in babies are due to infection by the pneumococcus, the staphylococcus, the *Micrococcus catarrhalis*, etc. The bad cases, those which lead to blindness, are usually due to the gonococcus of Neisser, or the gonorrhea germ (Fig. 216). It gains access to the eyes from the vagina while the infant is passing through, or it is wiped into the eyes by the nurse or doctor when the infant is given its first attention (the bath, etc.), or it is allowed to get in during the first days of life from an infected bath-tub or

the finger of the nurse, or perhaps the mother herself while the child is being handled.

In whatever way the germ gains entrance, it quickly sets up a violent inflammation of the conjunctiva. At first the lids grow red, then there is a thin, irritating discharge, with yellowish flakes. After a few hours this becomes purulent and the lids become so swollen that the eyes are closed (Plate VI). Unless active and constant treatment is instituted, the inflammation gains headway, the cornea may ulcerate, leaving ugly scars which shut out the light, or the lens may escape and the whole eye be destroyed. One-fourth of the blindness in the world is caused by this dreadful affection, and it is primarily venereal in origin. If ever a nurse has the opportunity to show of what she is capable, now is the time. Really at least two nurses are required in a case of ophthalmia. Treatment must be unremitting, and each order of the doctor must be punctually carried out if the lifelong misery of a sightless existence is to be averted. Early treatment is imperative; therefore the nurse watches the eyes carefully and reports to the doctor the moment she finds any signs of inflammation. Smears are sent to the laboratory.

Prevention.—If a woman is known to have gonorrhea, or if there is a foul discharge, the doctor may wish the vagina douched antiseptically several times during labor, and extra care taken that nothing gets into the eyes at any time. In all cases directly the head is born the face is wiped with pledgets squeezed dry out of a weak bichlorid or lysol solution; then the lids may be opened, and warm boric solution allowed to flush out the conjunctival sacs. After this the Credè method, or some equally reliable method of prevention, is used. If a case occurs or is suspected in a nursery where there are other children, the infant is to be isolated at once, separate utensils used for it, its clothes disinfected before being sent to the laundry, and the nurse should not touch anything that will be used for the other infants.

PLATE VI



Acute ophthalmia neonatorum.

Treatment.—In the first stage of the disease the physician may order ice applied to the eyes. If only one eye is affected, the nurse protects the other one by covering it with cotton and holding this in place with adhesive plaster. The arms of the baby must be bound down to the sides, so that infection may not be carried by them to the sound eye.



Fig. 217.—Arrangement for application of ice to the eyes. Long-sleeved gown, rubber gloves, and goggles are worn by the nurse.

The covered eye should be inspected every four hours for evidences of beginning infection.

The application of ice to the eyes is shown in Fig. 217. A large piece of pure ice is placed in a sterile basin and normal saline solution is poured over it. Wisps of sterile cotton the size and shape of a 5-cent piece are moistened in the saline solution and laid on the ice to cool. The

infant is placed on a warm-water bag, then on a pillow on a table, and snugly covered up. The nurse then seats herself comfortably at the head, and places the ice-cold pledgets on the lids, changing them every minute, and throwing the waste into a paper bag at the side. The order may be to keep up the application of cold for twenty-four hours and not to interrupt it while the child is nursing.



Fig. 218.—Arrangement for irrigation of the eyes.

The secretions must be frequently removed from under the lids, because they are very acrid and erode the delicate cornea. This is the great danger of the disease. For removing the pus from the eye the best method is a stream of saline solution. The nurse arranges things as in Fig. 218. In the can or douche-bag is the solution as ordered, of

a temperature of about 95 F. Iced salt solution has been recommended. The bag hangs 20 inches above the infant's head, and the tube is armed with an ordinary rubber catheter, or bulbous tip, with a large opening. The force of the water must not be too great. The nurse arranges the child on the table or her lap on a piece of cellophane leading into a bucket. The left hand opens the lids, the right holds the point in the fingers, while the ball of the hand rests on the side of the infant's head, steadying it. The point is directed at the inner corner of the lower eye, so that the force of the stream washes everything from under and from the inner corner of the lid outward. The infant usually opens the eye under the gentle force of the stream, but if it does not, the left hand may be used to separate the lids. Gentleness, gentleness, gentleness! These irrigations may be needed for weeks or even months.

The physician may make applications of nitrate of silver to the lids, or may prescribe the newer remedies, protargol or argyrol. Atropin is sometimes used to dilate the pupil, and the nurse should watch for its toxic effects. Conscientious nursing alone will save the light of day for the babe, and the baby must be provided with mother's milk, fresh air, and all possible aids to strengthen his system and thus enable him to throw off his disease.

Care of the Nurse Herself.—During all this prolonged course of treatment the nurse should protect herself from infection. This is done, first, by never touching her own eyes during the treatment of such a case without previous thorough sterilization of the hands; second, avoiding spattering solutions, used for irrigation, on her person or dress; third, using rubber gloves and large spectacles or automobile goggles for all treatments.

Infection of the Mouth and Throat.—One of these, thrush, has already been considered. The gonococcus may infect the throat, and the child may have a pharyngitis due to streptococci. The writer has noticed pharyngitis with

fever more commonly in general hospitals that accept maternity cases. Cases are reported where the infection invaded the Eustachian tube, the middle ear, and thus reached the brain. A streptococcic septicemia may result from gastro-intestinal infection.

Pyelitis is an infection of the pelvis of the kidney, the germs usually coming from the intestinal canal. Whenever the baby has fever or acts sick the urine should be examined for pus, in addition to albumin, etc. In boys the urine is collected in a test-tube fastened over the penis with strips of adhesive. In girls a special little urinal is used (see Fig. 213). The doctor will prescribe a urinary antiseptic and much water.

HEMORRHAGES IN THE NEWBORN

Quite a number of children are lost at a very early period of life through hemorrhage. This is a subject of which little is positively known. The newborn may have more or less profuse hemorrhage from the bowels—the so-called *melena neonatorum*, so named because the blood is black; there may be hematemesis; hemorrhage from the navel; from all mucous surfaces, or into the skin or even the brain. The child may be a “bleeder.” The nurse can do nothing but compress a bleeding spot favorably situated until medical aid can be obtained. The physician may order hemoplastin administered, or calcium chlorid, to increase the clotting power of the blood, or saline solution, or perhaps all three, and the nurse should make the necessary preparations. Nowadays hemorrhage is treated by the injection into the child of blood drawn from an adult, or of human blood-serum, or that of the horse or rabbit.

OPERATIVE INJURIES

During obstetric operations the nurse may marvel at the amount of force used by the accoucheur, fearing that both mother and child may be destroyed. While it is true that

in many cases both escape entirely, it is also true that in not a few cases both mother and babe are seriously and irreparably injured. Bones of the arm and leg are not seldom broken, the skull may be fractured, or a hemorrhage in the brain may be caused by difficult operative deliveries. Minor injuries are pressure-marks by the forceps on the head and face, facial paralysis, and bruising of the face, with swelling of the eyes. Infants born in face presentation

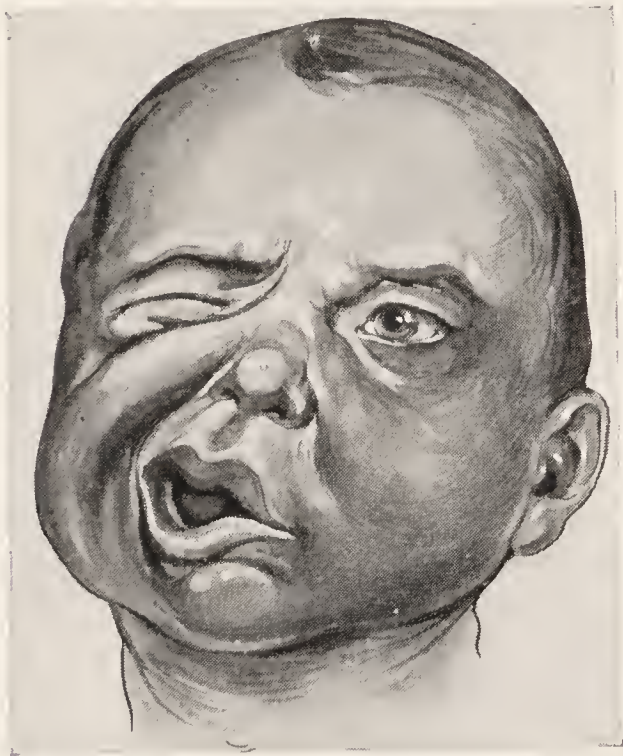


Fig. 219.—Left facial paralysis following delivery by forceps (Budin).

are much disfigured. The lips are swollen and the face mottled with hemorrhages in the skin.

The facial paralysis (Fig. 219), while it distorts the face a great deal, almost always disappears before the end of a week. The swelling of the eyes and face goes down in a few days, the nurse may assure the mother.

Pressure-marks left by the forceps crust over and dry, healing taking place underneath. If they are deeper, extending into the bone, a bit of skin, or even a bit of bone, may ulcerate off, with the production of pus. The anti-

septic care given ordinary surgical wounds is applied in these cases. Antiseptic solutions should be very weak when applied to infants, as they are susceptible to chemic poisoning.



Fig. 220.—Duchenne-Erb's paralysis of right arm.

When the physician has set broken bones, the nurse will see that the dressings remain in place, sewing them securely if necessary; that they do not become soiled by urine, vomit, or other discharges; that they do not cut the infant or cause chafing, and that the parts below do not swell from too tight bandaging.

Duchenne Erb paralysis of the arm may be due to

difficult breech delivery. If the nurse sees that the baby does not move its arms naturally it is to be reported at once. Early treatment helps.

Injuries to the Brain.—It is best for the infant if it comes into the world easily, without assistance from art. Few accoucheurs are skilful enough to improve on the processes of nature. We know that nature occasionally inflicts damage on the child even in normal spontaneous



Fig. 221.—Showing how a caput succedaneum is formed.

delivery, but the chances of injury by operation are greater at the hands of those obstetric attendants to whose care the vast majority of births is consigned. True, this injury may be slight, or not even apparent at the time, but evidence is accumulating that birth-injuries lead to nervous diseases later in life, as headaches, imbecility, epilepsy, insanity. More light is needed on this subject. Difficult operative deliveries may produce hemorrhages, small or large, in the brain. These may produce cyanosis, convulsions, and

death within a few days, or, if the child recovers, permanent paralysis remains (Little's disease).

The nurse will watch narrowly for drowsiness, blue spells, refusal to nurse, twitchings of the facial muscles or those of the extremities, a shrill, high-pitched cry, rigidity of the body, as these are all signs of cerebral trouble. The physician may order the clotting and bleeding time of the baby's blood determined, or a spinal



Fig. 222.—Double cephalhematoma. This followed a spontaneous and relatively easy delivery.

puncture made. Blood coagulants may be administered or, indeed, a decompression operation performed on the brain.

Caput succedaneum is a swelling on the top of the newborn infant's head (Fig. 221), found at birth, due to the pressure and venous congestion it undergoes during delivery. The edema disappears in from a few hours to a day.

Cephalhematoma is a blood tumor on the cranium of the infant, lifting the periosteum from the bone (Fig. 222).

It appears, after a day or so, as a roundish, soft, painless, fluctuating swelling on either side of the head. Depending on their size, cephalhematomata persist for weeks or months, but they will gradually be absorbed. The mother's fears may thus be allayed. Few physicians operate in such cases.

CONGENITAL DEFORMITIES

It is well that **monstrosities** are so seldom capable of extra-uterine existence, since they are not uncommon. When a monster is born, the nurse should not allow the mother to see it, and it should be hidden from the gaze of

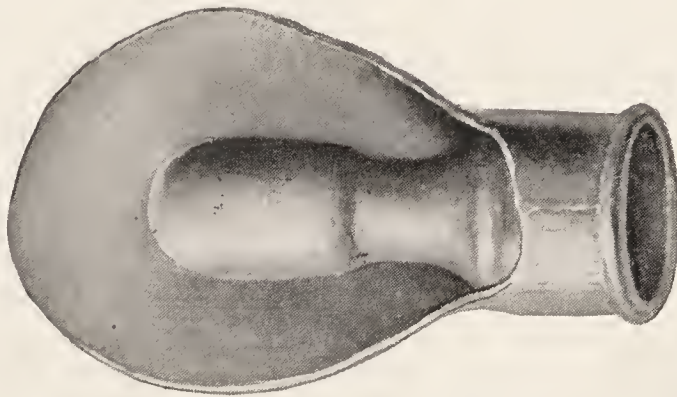


Fig. 223.—The Brophy nipple for babies with cleft palate, easily made by the nurse. The flap is trimmed to fit the child's palate.

curious relatives or friends. The mother must never know she has given birth to such an infant.

If the child is born with a **harelip** or a **cleft palate**, nursing may be so seriously interfered with that the general health may suffer. Mucus accumulates in the throat and may cause pneumonia. To avoid this the child is to be kept in a partly sitting position. The physician may provide a special nursing nipple for such cases (Fig. 223), or direct that the child be fed by gavage until strong enough to bear operation.

Occlusion of the anus or **imperforate anus** the nurse will discover when she comes to take the infant's temperature and by the fact that the bowels do not move. The

physician is to be informed at once, as an operation must be immediately undertaken to make a passage. Occasionally the bowel is occluded higher up, and laparotomy may be performed. The end is almost uniformly fatal.

Tongue=tie is a very simple condition, but it may be the cause of the child's not nursing properly, and is often overlooked. The tip of the tongue is attached to the gum of the lower jaw by a thin band. This should be nicked at the edge with scissors, and then torn back by the finger-tip. The physician is to do this, as there is sometimes persistent and perhaps dangerous oozing.

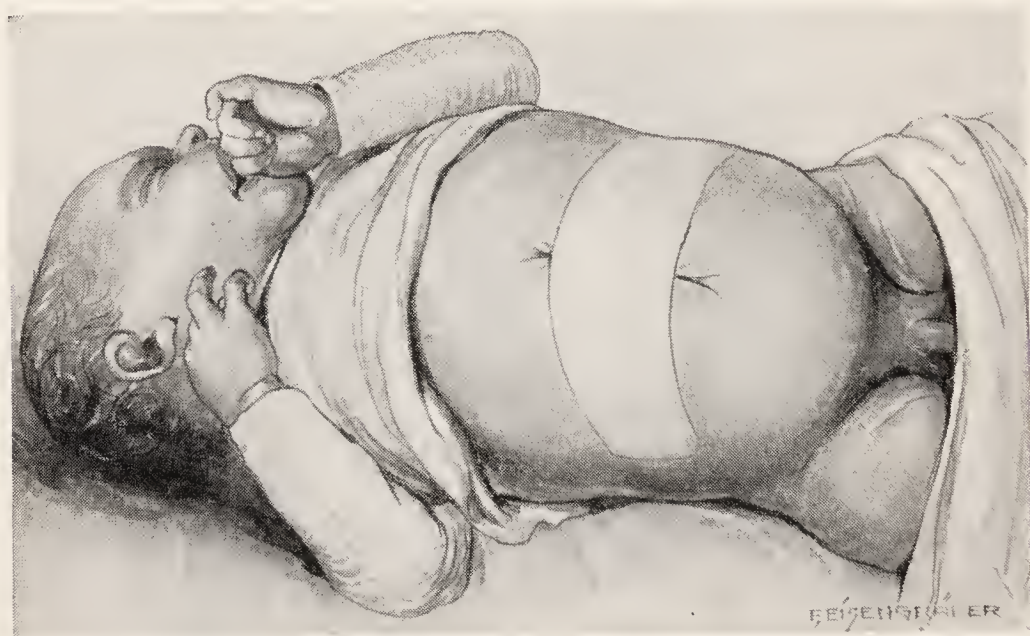


Fig. 224.—Adhesive plaster applied for the cure of umbilical hernia.

Hernia.—*Umbilical hernia* is quite common, and is due to imperfection of the abdominal wall at the navel, and not to improper tying of the cord. Spontaneous cure is the rule, and this may be hastened by a 2-inch strip of adhesive plaster, placed so as to hold the navel together from the sides without a button underneath (Fig. 224). First the skin should be disinfected and dried with alcohol.

Inguinal and *femoral hernias* are rare. Premature children may have them. They often heal spontaneously, although they are more likely to need a truss than the navel hernia. The prognosis is good.

SUNDRY COMPLICATIONS

Convulsions.—In the first three weeks infants may have spasms from cerebral injuries received during labor, such as fracture of the skull and hemorrhage in the brain; second, from intestinal disorders associated with a general toxemia; third, from the so-called “starvation fever,” which the author believes is an auto-intoxication or infection; fourth, from tetanus or lockjaw infection; fifth, from cerebrospinal meningitis the result of infection, usually from the navel or nose or ears; sixth, from atelectasis pulmonum—this is commoner in premature infants; seventh, spasmophilia.

Very often preceding the actual convulsion the child will show premonitory symptoms. These are twitching of the muscles of the face or extremities, stiffness of the jaws or of the body (in tetanus the stiffness of the jaw is marked), refusal to nurse, continual sucking or swallowing movements, a staring expression in the eyes, and a short, high-pitched, sharp cry without any apparent cause for it. When the nurse observes these things, or if she is surprised by the actual spasm, she will inform the physician at once. Little can be done until he arrives. Should the infant stop breathing after the convulsion, or if the cyanosis is too prolonged, a warm full bath may be given and a few drops of diluted essence of peppermint poured down the infant's throat.

The physician may order sedative medicines, as bromid and chloral, and ice to the head, or do spinal puncture.

Lockjaw, or tetanus, is due to infection, usually of the navel, with the tetanus bacillus. Dust or dirt, nothing else is the cause, and it means some lack of asepsis in the tying and cutting of the cord, or its after-care.

The first symptom the nurse may note is the general illness of the child, then refusal to nurse, then stiffness of the jaws; now come rigid convulsions—the body may become as stiff as a ruler.

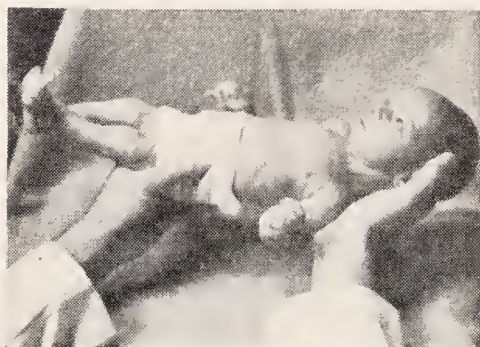
Treatment has been fruitless, although perhaps with



Opisthotonos.



Total body rigidity.



General tonic spasm.



Convergent strabismus.



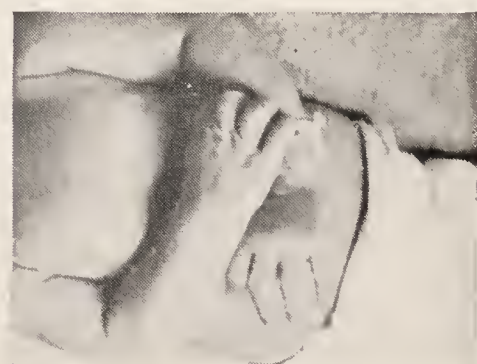
Just before strabismus.



Spasm of facial muscles with high-pitched cry.



Facial spasms.



Tonic spasms of hands.

Fig. 224a.—A baby with convulsions. From a motion picture.

the antitetanus serum there may be more hope of saving the child. In hospitals care must be taken not to carry the infection from one infant to another.

Complications Due to the Use of Hot-water Bags.—

The hot-water bag itself should not be a complication of the first infancy, but it not infrequently is so. Nurses cannot be too earnestly admonished to watch warm-water bags applied to children and patients in general. If a bag leaks or if its cover or the child's skin is moist, the danger is greater. The bag should never feel hot to the skin. The nurse should not trust the sensitiveness of the hand, because the skin here is tough and cannot judge high temperatures. The bag should feel just comfortably hot to the cheek, about 125 F. It must be well stoppered and perfect. The baby must be dry. The electric pads on the market also are not safe, but require watching. Breaks in the insulation of the wires may allow a short circuit and set the bed on fire.

Sometimes a hot-water bag may raise the temperature in the rectum, giving the nurse the impression the child is feverish.

Overlying the Child.—When the infant is permitted to lie with its mother, the latter, turning in her sleep, may smother it. The nurse will find the child dead in the bed. In cases of illegitimacy the question of deliberate infanticide will come up.

Asphyxia Neonatorum.—Children sometimes die of asphyxia or suffocation during pregnancy, but more often they are lost through this accident during or just after delivery. The asphyxia may be caused by too early separation of the placenta, by compression of the umbilical cord, or by pressure on the brain. Before delivery the physician knows the infant is suffering from a lack of oxygen and, therefore, is in danger of asphyxia, by the irregularity of the heart-tones and the passage of meconium. Unless the cause of the asphyxia can be removed or the child brought out into the air, he will die.

There are two degrees of asphyxia, called asphyxia livida and asphyxia pallida, the first being mild, the latter severe. In livid asphyxia the child is dark blue and stiff and the face is swollen; in pallid asphyxia the child is pale, except around the mouth, which is blue, the body is limp as a rag, and the heart beats faintly or not at all. Unless the child can soon be gotten to respire regularly, death ensues.



Fig. 225.—The tracheal catheter. This should never be boiled, as it is woven and varnished. It must be cleaned out with a wire after use and sterilized in bichlorid solution or formaldehyd vapor. The glass mucus trap is to prevent the contents of the baby's lungs from being drawn into the operator's mouth. It may be boiled.

Treatment.—This consists of removal of foreign matter from the air-passage, preservation of the body heat, and artificial respiration. The physician may aspirate mucus, blood, etc., that may have been drawn into the windpipe, by means of a tracheal catheter (Fig. 225), or he may hold the infant as in Fig. 226 and wipe the mucus from the back of the throat, first stroking the windpipe between the thumb and forefinger to bring the mucus into the pharynx. It

may be sucked out with an ear syringe. By compressing the chest the mucus may also be brought out of the trachea within reach of the finger. The infant is then placed in a



Fig. 226.—Resuscitation of an asphyxiated infant. Compression of the chest, then relaxation, twenty times per minute.

hot bath (106 F.). Some physicians place the infant alternately in hot and cold water—a severe shock to the little one, and a procedure the author has never found necessary.

In mild cases these measures suffice to bring about normal breathing, but in asphyxia pallida the respiratory apparatus is paralyzed, and the physician or nurse must



Fig. 227.—Sylvester's method of performing artificial respiration. First motion: Expiration. The arms are pressed firmly against the chest. The infant is covered with a warmed towel during all these maneuvers.

perform artificial respiration until the nerve-centers recover enough to carry on the function.

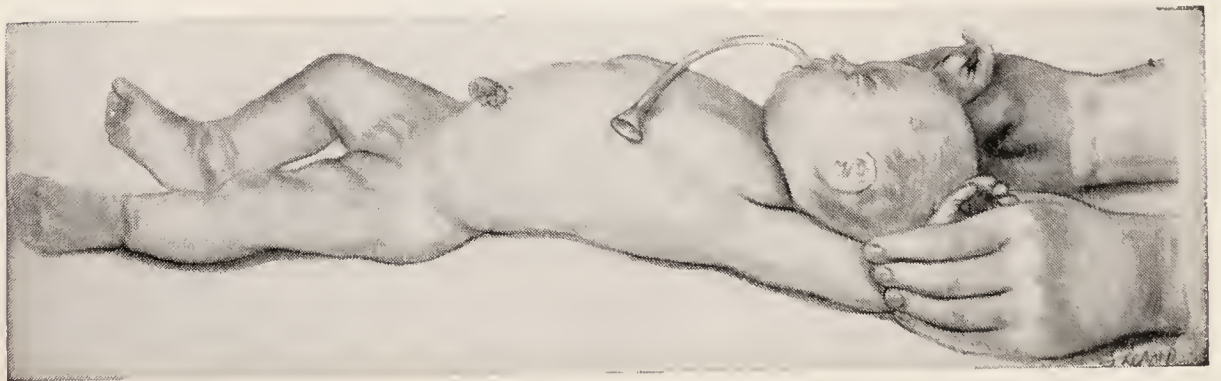


Fig. 228.—Sylvester's method of performing artificial respiration. Second motion: Inspiration. The arms are stretched firmly above the head. Keep the baby warmly covered.

There are many methods of substitute breathing, but the nurse may practice only a few, the others being dangerous and for the physician to employ.

A simple method is shown in Fig. 226. The child is

supported by the feet, with the forehead resting on a table, so that the head is pressed a little backward. Mucus, blood, etc., are removed from the fauces, and then, with the thumb over the back and the fingers over the front of the chest, the nurse makes light compression. This forces the chest together, and, by suddenly relaxing the pressure, the elasticity of the ribs opens the chest and air can be heard to rush in. This maneuver is repeated twenty times a minute.

Another method, known as Byrd's, consists in alternately folding and unfolding the child like a book. Sylvester's method, used so much in resuscitating drowned persons, may also be employed (Figs. 227, 228). It consists of alternately stretching the arms high above the head and pressing them down fast to the sides. The "prone pressure" maneuver so successful in adults is not very practical with newborn children but it may be tried. The physician may pass the catheter (Fig. 225) into the trachea by means of a lighted laryngoscope to remove mucus and introduce air or he may insert the tube with his fingers by touch and he may blow air or oxygen or carbon dioxid directly into the lungs; administer adrenalin directly into the heart, or give lobelin intramuscularly.

Throughout all these procedures continual care is to be taken not to cool the babe too much. The skin is wet, the child shocked, and he refrigerates rapidly. In fact, sometimes the child dies because of too violent and prolonged manipulations intended for resuscitation. The hot bath, warm flannel receivers, and the warm-water bag, gentle friction with a warmed hand under cover, all tend to keep up the baby's temperature.

After the child has begun to breathe, he should be warmly clad, surrounded by warm-water bottles, placed in an airy room, or, if there was much shock, in the incubator for a few hours. An infra-red ray lamp is useful to warm the baby up quickly.

Observe the four principles of resuscitation of asphyxiated infants:

1. Clear the air passages.
2. Keep the baby warm.
3. Perform artificial respiration.
4. Remember the baby is in shock, and treat it.

Infants revived from asphyxia occasionally develop a secondary asphyxia which is worse than the first, as it is due to atelectasis pulmonum or hemorrhages into the brain. The child is, therefore, to be carefully watched for signs of returning cyanosis and for the characteristic grunt or moan. Since hemorrhage may occur in the brain, the nurse will look for symptoms of cerebral irritation, although treatment of such accidents is not hopeful even with operation.

CHAPTER VI

THE CARE OF PREMATURE INFANTS

THE care of premature infants requires the highest kind of nursing skill and the greatest self-sacrifice and devotion. The results, however, are gratifying in the extreme, as nearly every child that can respire and digest food can be saved. These children grow up and are strong, so that there is no argument for refusing them the necessary care.

There is a popular notion that children of the eighth month of pregnancy have less chance of survival than those of seven months. This notion, like many others, is a popular fallacy, although it is very old, dating from the time of Hippocrates, who said that the weakness of the eight months' child was due to its being tired with efforts to leave the uterus, whereas if it waited until the ninth month it was sufficiently strong.

The longer the infant remains in the womb, the stronger it becomes, although if the pregnancy goes too far over time, the child may die. We regard as premature all children born before three weeks of the normal end of pregnancy. Depending on the degree of prematurity, the children present the following characteristics: They are small, weighing from 2 to 5 pounds; the skin is red, thin, and the blood-vessels show through; the body is partly covered with a fuzzy growth of fine hair called lanugo; the nose has little white comedones; the ears are soft and pliable; the child looks old, especially after a week, when the loss of weight has occurred, and the little body is shriveled; the cry is weak and whining, but most of the time the infant lies in a peculiar stupor; the temperature has a tendency to be subnormal and very irregular; the

bowels are sluggish; the urine is scanty; later jaundice is usually marked.

The initial loss of weight is relatively greater in premature infants, and the return to the birth weight is much slower, requiring some twenty to thirty days. Since the appetite is often in abeyance, these little mites would starve to death unless fed forcedly. The lungs of premature infants are slow to unfold, remaining in a condition called atelectasis pulmonum. This is usually fatal unless soon relieved.

Latterly our knowledge of premature infants has increased, and we are more successful in rearing them. To be successful requires three things: first, mother's milk; second, good nursing; third, a good incubator. That heat is absolutely necessary for premature infants was known since ancient times. In the Middle Ages premature infants were wrapped in the skin of a sheep with wool on, or put in a jar of feathers. Later they were enveloped in cotton. Sterne, in the middle of the eighteenth century, relates how the child of a physician was raised by the "same artifice that one used to make chickens hatch in Egypt. He put his son in an oven, properly constructed, heated regularly, the temperature of which was regulated by suitable instruments." Nothing came of this suggestion.

In 1857 Denucé described a double-walled bath-tub, with water in the interspace, for the rearing of feeble infants. In 1866 Credé, of Leipsic, used an identical contrivance, although he did not publish it until 1884. In 1880 Tarnier had Odile Martin, a poultry raiser of the Jardin de Plantes, Paris, construct an infant incubator on the plan of a chicken incubator. It was installed in the Maternité, and could hold several children. Winckel constructed a permanent bath in which the child floated, thus avoiding the rapid evaporation and imitating more closely the liquor amnii. This bath is obsolete now. Some hospitals have a double-walled room, properly ventilated and heated to

84 F. all the year round. The discomfort of the attendants and the danger of spreading infection among these sus-



Fig. 229.—Clothes-basket made into an incubator. Either bottles or hot-water bags may be used.

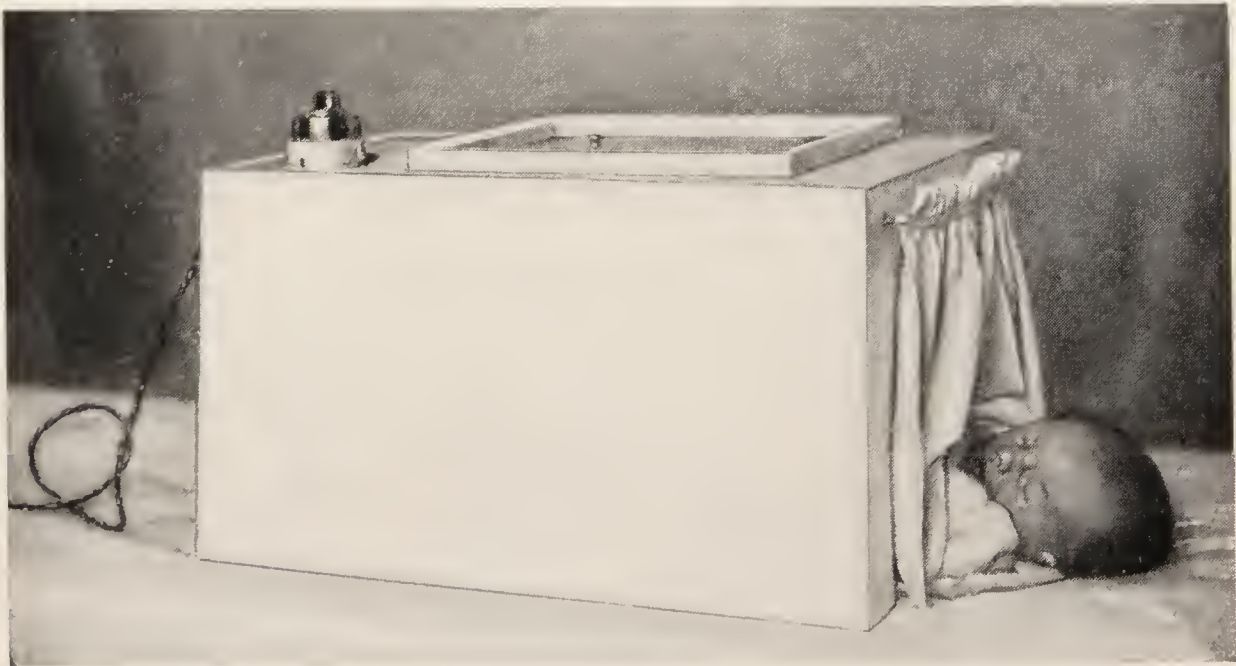


Fig. 230.—Nobel's warm box.

ceptible infants are the objections to this method. Cragin invented an electric incubator large enough for two infants;

Hess, an electrically heated crib-shaped tub. The individual incubator connected separately with the outside of the house by an air-intake pipe is the best, but it requires constant expert observation, and most hospitals cannot afford the expense.

If an incubator of modern type cannot be obtained, one can improvise a warm nest for the infant by means of a large clothes-basket well lined with blankets, a soft pillow, and 6 or 8 hot-water bottles (Fig. 229). These are changed frequently. With constant attention such a makeshift will do better work than most of the incubators on the market.

For a full consideration of the subject of premature infants see the volume of Dr. Julius H. Hess.

THE INCUBATOR OR COUVEUSE

There are several, made of wood and of metal, on the market. Some open at the top, others at the front. Some, as the Auvard, are heated by hot-water bottles, some by hot air, some by hot water, which is by far the best method, because the temperature is kept evenly. Most incubators have no automatic heat regulation, and with such the nurse must carefully watch the thermometer which is placed inside, and provide more or less heat as needed. Both overheating and chilling are to be avoided. A few instruments have automatic heat regulation, but even here the nurse must occasionally consult the thermometer to assure herself that the thermostat (or heat regulator) is working properly.

In all incubators heated by steam or hot water the nurse must see that the supply of water does not run low. This endangers the infant and also the apparatus.

The ventilation of the incubator is highly important. The writer has never seen a closed incubator ventilate properly unless it was connected with the air outside the building. All incubators of the box type require the lid to be left slightly open, to insure the infant an adequate fresh-

air supply. This is especially necessary in summer. The air seems to stagnate. The incubator should be raised at least 2 feet from the floor, and should be free from exposure to drafts, dust, and chilling. It must be lighted, because for the first week the infant requires close watching.

Every city should be provided with an "incubator station." This is a plant connected, preferably, with a children's or lying-in hospital, consisting of several incubators and the necessary specially trained nurses, wet-nurses, and mechanical appurtenances. To these stations children could be brought, even from great distances, for that particular care which special training and practice only are able to bestow. The station of the Chicago Lying-in Hospital is a model of this class, and deserves a short description here:

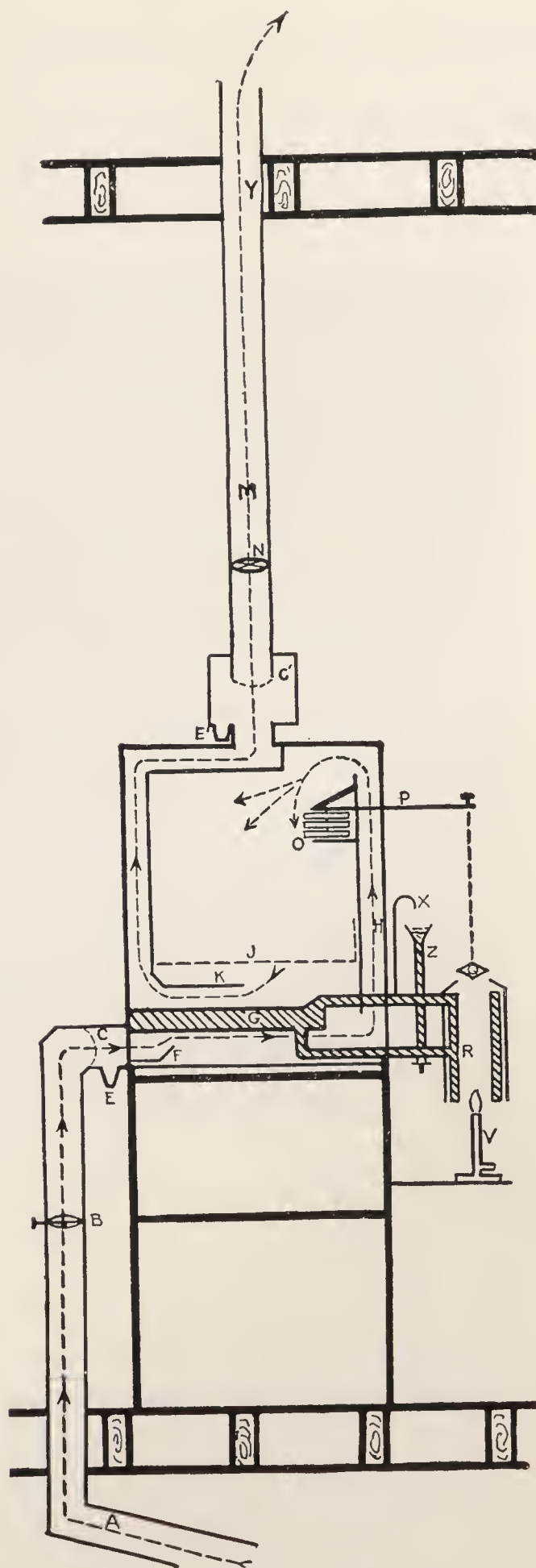
As shown in Figs. 231 and 232 the incubators are of steel and glass, and embody principles of heating and air circulation used in no others. They are heated by a hot-water pan placed 5 inches below the infant's bed. The boiler for heating the water in the pan may be seen at the right side. The system is identical with that used in the hot-water heating of houses. The heat regulator is above the boiler, and, once set at the desired temperature, requires no attention. The child is handled through the two doors in front, and is fed through the sliding window on the left. On the left and on top are boxes, each containing a glass of water. This is for moistening the air. The air, fresh from the sunny outside, is led by a 3-inch flue directly into the box, from either above or below, passing through a cotton filter. The opening from the box into the heating chamber of the incubator is closed by a sliding damper, by which the amount of air admitted to the apparatus is regulated. The air is heated by passing around a large pan of water (connected by pipes with the water boiler on the outside), and, after circulating around the infant, is automatically removed through a flue on the top of the box. When the wind outside the hospital is in an opposite direction the air



Fig. 231.—Three of the incubators of the system at the Chicago Lying-in Hospital. Owing to the Depression we have had to dismantle these incubators. When the station is re-established we will replace the gas-hot-water system by electric heating units with thermostats similar to those used in bacteriologic incubators.

enters from above and escapes below. A little wheel in this flue (an anemoscope) indicates the current of air. The

Fig. 232.—Diagrammatic section of incubator system in Chicago Lying-in Hospital: *a*, Pipe bringing air from outside; *b*, damper; *c*, cotton filter; *e*, glass of water in moisture-box; *f*, screen to distribute air evenly under warming-pan; *g*, water-pan; *h*, flue conducting air into bed-chamber; *j*, bed; *k*, draft plate to lead air out of bed-chamber into flue; *l, l*, escape flue; *m*, chimney; *n*, anemoscope; *o*, ethyl-chlorid disks; *p*, lever; *q*, cover of air-flue over heater; *r*, hot-water boiler; *v*, gas-burner; *x*, air-vent to hot-water system; *y*, exit flue through ceiling to outside air; *z*, filling cup for the hot-water heating system. The dotted line shows the usual course of the air through the instrument, but the air flues are so devised that when the wind blows in an opposite direction reversal of the current makes no difference in the ventilation.



child lies in a basket suspended over the hot-water pan; the mattress on which it lies is of eiderdown.

A delicate thermometer is fastened near the side window, so that it may be easily read, and a hygrometer, to indicate the degree of moisture, hangs in the back.

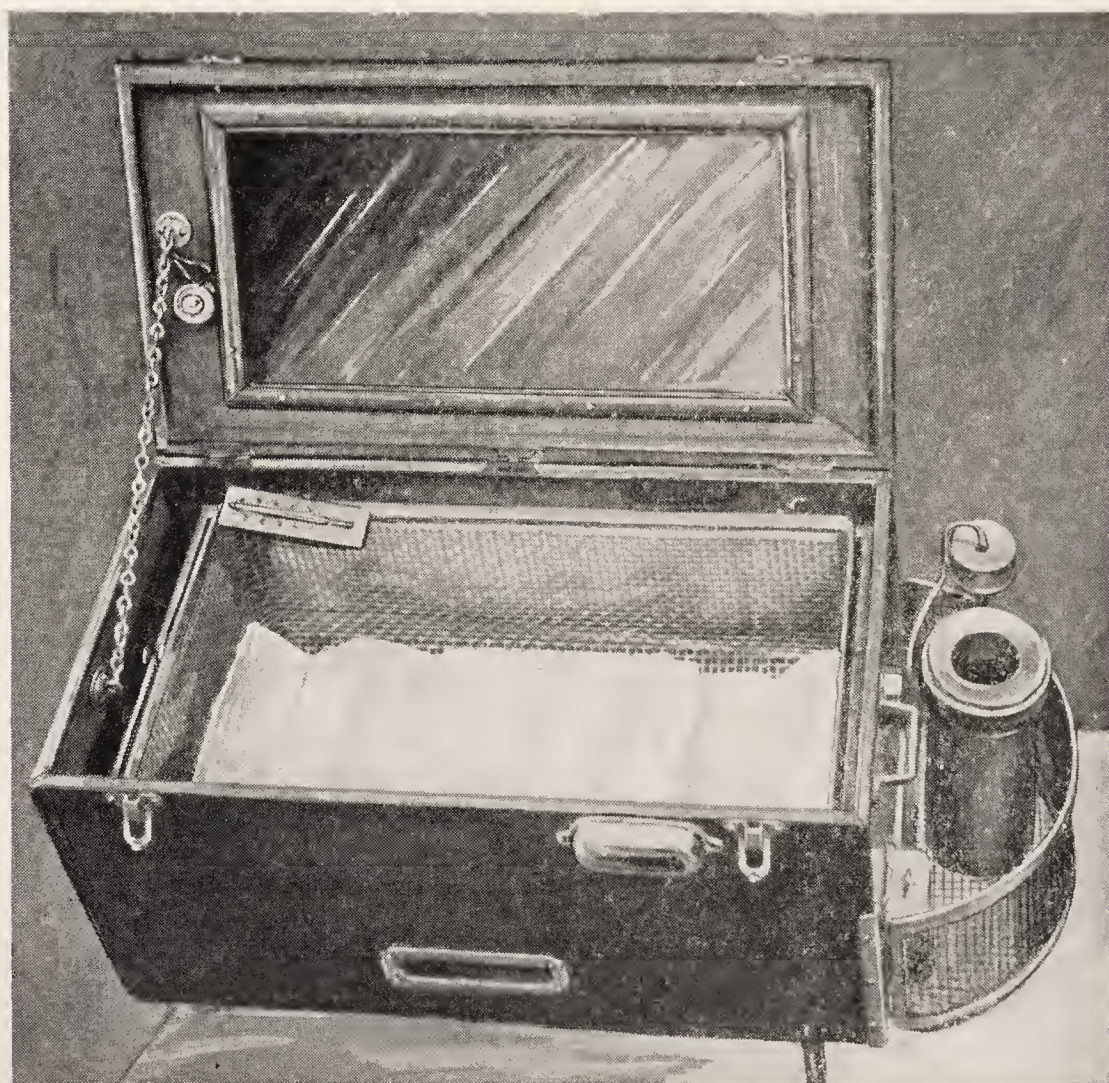


Fig. 233.—Incubator ambulance open, showing electric light, thermometer, infant's basket with eiderdown flannel mattress, and coverlet.

The room in which the incubators are installed has also a natural ventilation through the ceiling to the outside of the building. The schematic drawing will show the tortuous current of air; the nurse may follow the dotted line in its windings from below the floor, through the apparatus, and out through the ceiling. This is an ideal arrangement, as it provides a certainty of fresh, filtered, moistened air, and

even in stormy weather precludes a draft through the incubator.

Many children have to be brought from distances, sometimes of many miles, and for such transportation an ambulance incubator is provided (Figs. 233, 234). This is a perfect incubator in miniature, with a circulating hot-water system heated from the outside by an alcohol lamp, well ventilated, and lighted by electricity. It is 21 inches long, 11 inches wide, and 11 inches high, and can be easily carried by one person.



Fig. 234.—Incubator ambulance closed, ready for transportation of infant. During transit the child is closely observed through a window in the top.

Care of the Incubator.—The temperature should, as a general rule, be kept at about 87 F. It may fluctuate from 86 to 91 F. without being harmful. If the infant is strong or less premature, or if it sweats too much at this temperature, the regulator should be set at 82 F. or even 80 F. If the child is very premature or if its temperature persists in remaining low, the incubator must be warmer, being set at 91 or even 93 F. This, however, is seldom necessary for any length of time—two or three days at most, when a temperature of 87 F. is more desirable. With a little practice the nurse gets to know what degree of heat

is best suited to the particular infant. As the child grows older the temperature of the apparatus is maintained at 84 or 80 F., and then the infant is placed inside only at night, being put in a warm basket during the day.

The three hollow disks at the right of the chamber contain ether and regulate the temperature. By expanding and contracting they raise and lower the damper over the water heater, thus cooling and heating the water admitted to the warming pan.

With incubators without automatic heat regulation the nurse must consult the thermometer placed alongside the child, and increase or decrease the heat by the means provided in the particular apparatus. With a little experience the nurse can judge by putting her hand inside the incubator whether the air is of the right temperature, but this must not be relied on.

The *moisture* is important. In incubators of the style last described this is provided for by hanging a piece of gauze in the water-glass of the moisture box at the left. Should the hygrometer or, what is just as reliable, the dry mouth and lips of the babe show that more moisture is needed, this may be easily accomplished by placing a small flat pan of water under the bed on the warming-pan. In summer less moisture is needed than in winter.

The hot-water system of the large steel incubators requires little attention. The filling is done through the cup on the right side, and the system must be filled and water stand in the cup before the gas-burner is lighted. Every day a little water is supplied to replace that lost by evaporation.

In the old-fashioned incubators or in improvised baskets the hot-water bottles must be frequently changed.

The Ventilation.—If the incubator is provided with a flue and wheel, or anemoscope, the nurse can easily see that air is passing through the apparatus by the motion of the wheel. This wheel must be delicate and sensitive, or it will

fail to show the circulation of air. The nurse must see that the bearings of the wheel are free from dust and slightly oiled. Great care is necessary in handling it because of its delicacy. If there is no indicator of this kind, and in box incubators, it is safest to leave the sliding cover or door open a trifle, and protected from drafts by hanging a towel over it. This is necessary in summer in all apparatus not connected with the outside air. In addition, the ventilator openings provided in the incubator are left free. In winter or in very windy localities those incubators connected directly with the outside air need a little watching. While experience has shown that they can accommodate themselves to a change from 45° above to 8° below zero, and also functionate in a gale blowing 60 miles an hour, still the little life inside is so delicate and precious that one must be assured the apparatus is working properly. In winter the damper in the air-flue is kept almost closed; in summer, wide open.

The Bed.—The incubator bed should be of eiderdown. No rubber sheet is used. No pillow is needed. Sometimes it may be necessary to lower the infant's head, which is done by raising the foot of the basket. Cotton has been found objectionable as a mattress for the tiny babies; it is used for the larger ones and after the little ones have developed.

GENERAL CARE

The salient features of the care of premature babies are:

1. Keeping the tiny morsel of humanity evenly and constantly warm.
2. Providing sufficient easily assimilable nourishment and an abundance of water.
3. Supplying fresh air, warmed and moistened.
4. Preventing infection, especially of the lungs and gastro-intestinal tract.
5. Preserving strength by gentle handling, feeding, etc.

Of all things in the care of the premature infant the incubator is the least important, therefore many hospitals do without them. Good nursing and mother's milk will produce fine results even if an incubator has to be improvised from a wash-basket.

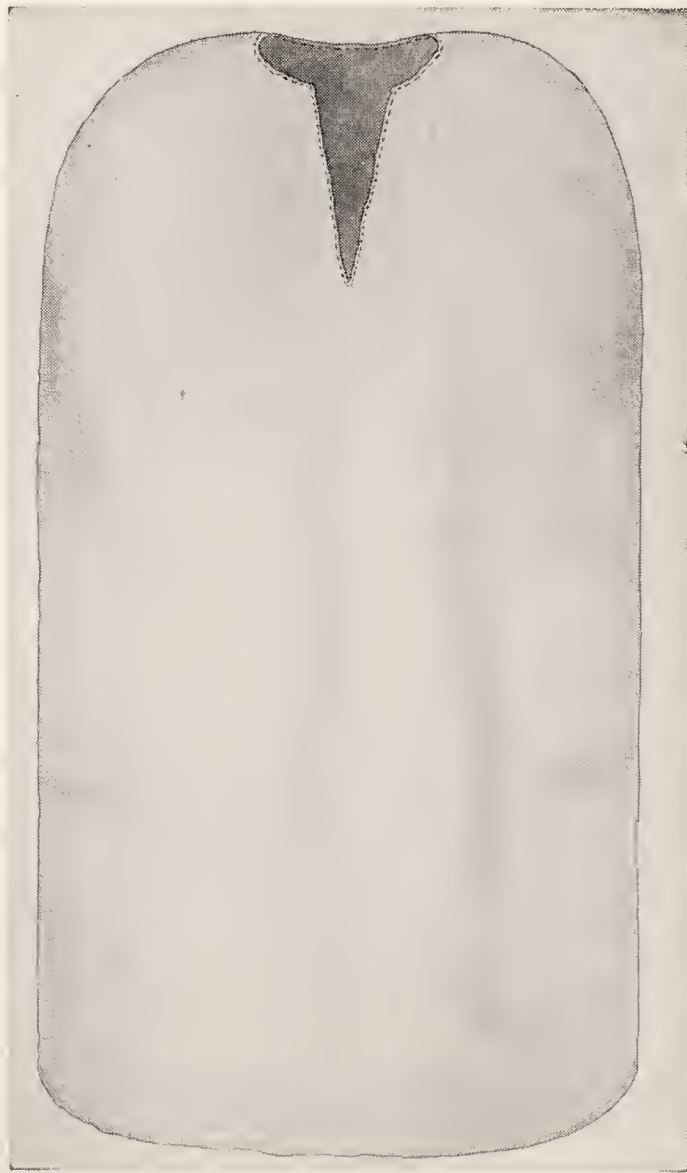


Fig. 235.—Incubator infant's dress.

The Dress.—This should be of the finest wool flannel obtainable, and made as simple as possible. As soon as a premature infant is born it should be wrapped in warm wool flannel and placed in the incubator; if no incubator is at hand, until proper provision can be made the child, wrapped in a warm woolen blanket, is surrounded by warm-

water bottles and kept in a very warm room. The nurse will note how the necessity of heat is emphasized.

A simple bag, 34 inches long and 20 inches wide at the bottom, stitched around the neck, without sleeves, has been found the best (Fig. 235). It is open at the bottom, so that the infant may be "changed" without trouble, and long enough to double over and make a sort of cover reaching to the shoulders. The child is covered by a light, wool-flannel blanket which makes a sort of hood over the



Fig. 236.—Incubator infant as it lies in the apparatus, showing the dress folded up over the body, making a blanket, and the shawl over the head and shoulders.

head (Fig. 236); the abdominal binder is of wool, the diaper alone being of cotton material.

After the child is removed from the incubator it naturally requires heavier clothing.

Warm Feet.—Even in the best incubators the child's feet may be cold; this is due to poor circulation. A warm-water bag should be laid under the feet, carefully protected so that it shall not burn. The temperature of the infant, taken by the rectum, may be elevated by this warm-water bag, a fact to be borne in mind in reporting or recording a fever.

The Diet.—Without question, mother's milk is the food for premature infants, and should be obtained at any expense of money and effort. It must come from a healthy woman whose own baby is thriving. For this reason an incubator station is better connected with the lying-in hospital or it must have a staff of wet-nurses. Feeding must begin a few hours after birth to avoid exhaustion and to combat the great initial weight loss.

For the smallest infants from 5 to 20 drops of water are given every hour with a medicine-dropper. If the child retains this, the amount is increased to 30 or 40 drops. Eight hours after birth 1 dram of mother's milk; sixteen hours after, 2 drams, and twenty-four hours after again 2 drams are given.

One cannot follow these tables exactly, some infants requiring less, others more, than herein stated; some infants require diluted milk for weeks. A small child that is several weeks old requires more than a larger infant in the first days. Occasionally a 3-pound baby will drink 1 ounce of

DIET TABLE USED AT THE CHICAGO LYING-IN HOSPITAL
For Infants Weighing Less Than 1800 Gm. (3 lbs., 12 oz.)

Days	Number of feedings.	Amount each feeding.		Total food.	
		Drams.	Cc.	Drams.	Cc.
2d.....	10	1 $\frac{1}{4}$	6	15.5	62
3d.....	10	2 $\frac{3}{4}$	11	27.5	110
4th.....	10	3 $\frac{1}{2}$	12.5	31.5	126
5th.....	9	4 $\frac{1}{2}$	18	40	160
6th.....	9	5	20	45.5	182
7th.....	9	5 $\frac{1}{2}$	23	51	204
8th.....	9	6 $\frac{1}{4}$	25	57	228
9th.....	8	8	31.5	63.5	254
10th.....	8	8 $\frac{1}{2}$	33	66	264
11th.....	8	9	35	70	280
12th.....	8	9 $\frac{1}{2}$	38	75	300
13th.....	8	10	40	80	320
14th.....	8	10 $\frac{3}{4}$	43	86	344

DIET TABLE USED AT THE CHICAGO LYING-IN HOSPITAL (*Continued*)
For Infants Weighing from 1800 to 2000 Gm. (3 lbs., 12 oz. to 4 lbs., 3 oz.)

Days.	Number of feedings.	Amount each feeding.		Total food.	
		Drams.	Cc.	Drams.	Cc.
2d.....	10	3	12	30	120
3d.....	10	$4\frac{1}{3}$	17	43	172
4th.....	10	6	24.5	61.5	246
5th.....	9	8	30.5	70	280
6th.....	9	$8\frac{3}{4}$	34	77	308
7th.....	8	$10\frac{1}{2}$	42.5	85	340
8th.....	8	$11\frac{1}{4}$	45	90	360
9th.....	8	12	48	96	384
10th.....	8	$12\frac{3}{4}$	51	102	408
11th.....	8	$13\frac{1}{2}$	54	108	432
12th.....	8	14	56	112	448
13th.....	8	$14\frac{1}{2}$	58	116	464
14th.....	7	17	68.5	120	480

For Infants Weighing from 2000 to 2500 Gm. (4 lbs., 3 oz. to 5 lbs., 4 oz.)

Days.	Number of feedings.	Amount each feeding.		Total food.	
		Drams.	Cc.	Drams.	Cc.
2d.....	10	4	16.5	41	164
3d.....	10	6	24.5	61	244
4th.....	9	8	31.5	74	296
5th.....	9	$9\frac{1}{3}$	37	84	336
6th.....	9	10	41	92	368
7th.....	8	12	45	95	380
8th.....	8	$12\frac{1}{4}$	48.5	97	388
9th.....	8	13	51.5	103	412
10th.....	8	$13\frac{1}{4}$	52.5	105	420
11th.....	8	14	55	110	440
12th.....	7	$16\frac{1}{2}$	66	116	464
13th.....	7	17	70	120	480
14th.....	7	$17\frac{1}{2}$	71	124	496

milk every two hours. As a general rule the child is allowed as much as it can be induced to swallow, and the appetite varies day and hour. One must not overfeed, because of the danger of indigestion and regurgitation. The former invites intestinal catarrh, while the latter may lead to choking and asphyxiation. On the other hand, one must



Fig. 237.—The nursing bottle for premature infants. Capacity, 1 ounce.



Fig. 238.—The feeding dropper.

give sufficient nourishment, because the spark of life is faint and the child cannot express hunger. Feeding must therefore, begin soon after birth, and be carefully and consistently practised. If the infant does not get enough food it will lose weight, it will lie in a peculiar stuporous condition, and will be subject to attacks of fainting, sometimes with marked cyanosis.

The amount of each feeding must be recorded, and if the infant nurses at the breast, it must be weighed on a delicate

scale before and after nursing, the difference representing the amount obtained. The total in twenty-four hours gives the amount ingested by the infant. It should be equivalent to about one-fifth of the child's weight. Thus a child weighing 3 pounds should be fed about 9 ounces of milk a day. If the child shows any symptoms of indigestion, a little peptic salt is given with each feeding.



Fig. 239.—Gavage. The child is placed on a table; the nurse holds the funnel in the curve of her index-finger and thumb, at the same time pinching the tube with the thumb-nail. The other hand guides the tube down the throat. Note the milk bottle in warm water.

Method of Feeding.—If the infant can suck and swallow, the milk is given by means of a small vial and a tiny nipple (Fig. 237). If the child can swallow but not suck, the milk is dropped into the throat with a feeding dropper (Fig. 238). The breast-pump that draws the milk, the bottle, the dropper, the nipples, etc., must always be sterile to avoid infecting the intestinal tract.

Should the child neither suck nor swallow, it must be fed by means of a method known as gavage, introduced by Tarnier, of Paris (Fig. 239). This consists simply of

feeding by means of a stomach tube. The tube used is a soft-rubber catheter, size 8, American scale, for the tiny babes, and No. 10 for the larger ones. It is attached to a small funnel or the glass part of the nipple-shield. When the proper amount of milk is obtained, which is done by means of a breast-pump (see Fig. 209) or milking, it is diluted and warmed, and the tube, etc., sterilized. The

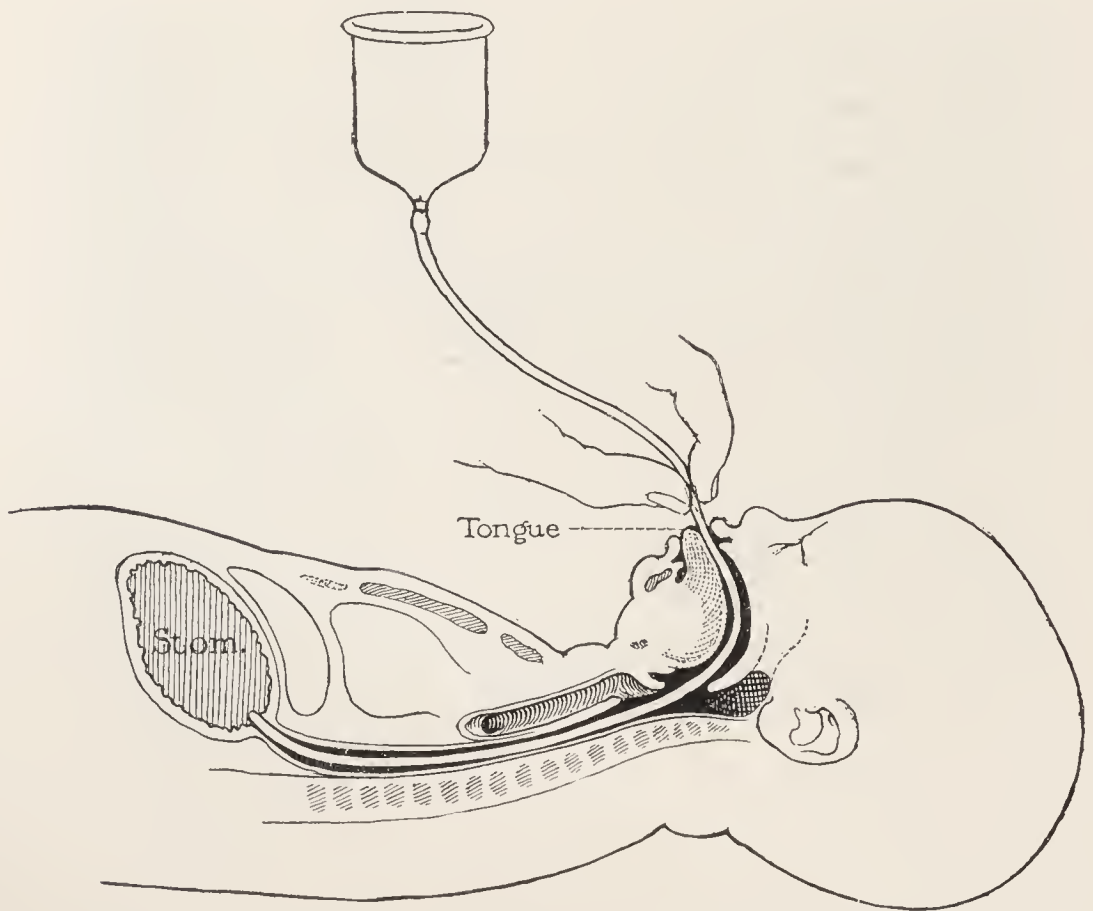


Fig. 240.—Shows catheter tip just within stomach.

tube bears a mark which indicates the distance it is to pass into the esophagus. This varies from 12 to 15 cm., depending on the size of the baby. The end of the tube is to project into the stomach only about $\frac{1}{2}$ cm. (Fig. 240). The distance from the root of the baby's nose to the ensiform appendix (the end of the sternum) will show about how far the tube is to be inserted.

The infant is placed on a table or the lap with the face upward and a little to one side. The nurse passes the empty

tube into the throat, pushing its tip against the back wall, thus to avoid the entrance to the larynx. The motion is gentle and slow. There is seldom much retching, the reflexes of the pharynx being undeveloped. Air often escapes when the end of the catheter enters the stomach. The tube is then pinched tight near the baby's mouth.



Fig. 241.—The Hess electric heated double walled incubator.

Now the milk is poured into the funnel and the air in the tube allowed to escape. The funnel is raised only high enough to secure a slow, even flow, about 6 to 8 inches above the baby's face. After the measured quantity has been given, one waits a few moments to allow the tube to empty itself, then with the finger and thumb-nail it is pinched hard,

and withdrawn quickly. The pinching is to prevent residual milk from escaping into the larynx. This may cause pneumonia. The infant is held quiet for a short time, after which it is carefully replaced in the incubator on its right side.

Overfeeding is very prone to occur with gavage, therefore one must refer to the table herein given, and watch the infant for signs of distress, as abdominal distention, vomiting, indigestion, etc. Tiny infants are fed in the incubator through the side window or by partly removing the cover of those constructed on the box pattern, but after the child is strong enough it is fed on the lap of the nurse, in a warm room, and protected from drafts. For gavage one must remove the infant from the couveuse.

As soon as the babe can be put directly to the breast, this should be done, as nothing can match the life-giving fountain. The quartz lamp is being used with benefit in cases of premature children, of course with accurately graded exposures.

One should see that the infant has sufficient water, and a few drops of sweet orange juice may occasionally be given with benefit. Since the interior of the incubator is warm and the skin is thin, evaporation is rapid, and, therefore, the little body dries out.

The Bath.—Premature infants should be handled as little as possible, because it is depressing to them. A bath such as is usually given to infants may throw them into collapse. The practice of smearing the infant with vaselin or sweet oil is bad, as it refrigerates the little body. The skin must be kept clean and the pores open or the infant will not thrive. As soon as the child is born it is covered warmly, and, in a hot room, the whole body is anointed with warm benzoinated lard. This is carefully and quickly wiped off, under cover, with a hot towel. The child is immediately placed in the incubator. If the infant is very weak the first dressing is postponed several hours or until

it has recovered from the shock of birth and the unavoidable exposure afterward.

Daily for the first week the whole body is anointed with finest benzoinated lard, an animal fat that sinks into the skin and furnishes a small amount of food. The face and buttocks are occasionally washed with warm water. When the infant is sturdier, it is given what is known as a "dip" every other day. This is a gentle immersion into water at 103 F. for not over thirty seconds. Then the little body is quickly lifted into a warm towel and dried. After this the whole body is anointed with the benzoinated lard. The bath as usually given is not employed until the child is quite vigorous.

The Care of the Eyes, Nose, Mouth, etc.—The eyes are not given any attention except ordinary cleanliness, and the same may be said of the nose, ears, and mouth. Extraordinary care must be used not to injure or abrade the tender mucous membranes, as the infant is very susceptible to infection, which may easily gain entrance in this manner. In girls the vulva must be handled with extreme delicacy and care be taken not to infect it. The buttocks are so tender that the skin cracks and inflames easily, especially if the bowel movements, from indigestion or enteritis, are sharp and irritating. In such cases no water should be used, and the treatment described on p. 460 should be minutely carried out.

In boys the diaper should be applied loosely, thus avoiding compression of the delicate external organs. The meatus urinarius should be inspected frequently, as a tiny bit of dried secretion might stop the flow of urine.

The infant must not lie long after urination or bowel movement before changing, first, because the discharges decompose quickly in the warm incubator and befoul the air in it; second, because the skin around the nates will become inflamed, and third, because it may lead to infection of the child. The change must be made quickly

and gently, with the smallest amount of exposure, and the child returned to the incubator without delay. Some incubators are arranged to allow this attention without removal of the child.

General Care.—Every day during the anointing the infant is given a general massage. This comprises gentle rubbing of the skin, kneading of the muscles of the extremities, and bending of the joints. That this must be extremely gentle and tentative at the start and more vigorous as the child grows stronger is not necessary to say. If the child is very premature, these attentions are given every other day. They are not omitted, because the infant needs some stimulation to bring it out of the torpid state in which it usually lies, and which disposes it to stagnation of the blood in the extremities and the lungs. The child should lie alternately on the two sides for the same reason. The temperature is taken by the rectum morning and evening, and every four hours if there is fever. Every other day the infant is weighed naked, and care should be taken that the little body is not chilled. For the weighing the babe is wrapped in a hot diaper. A record is kept of all these things.

Removal from the Incubator.—This depends on the age of the child and its rate of growth. As a general rule, when the temperature remains normal for days, when the child is about $4\frac{1}{4}$ to $4\frac{1}{2}$ pounds in weight, we remove it to its cradle. This varies, of course; so the length of stay is from five days to six weeks. There should be no haste in removing the child, as it will thrive better in the apparatus, having less to contend with. Operative cases are removed when they have recovered from the shock of the delivery. Some infants, even though small, are uncomfortable in the incubator, and sweat profusely, cry, and are fretful. These cases, which are rare, do better in a warm crib. Often these symptoms denote fever due to some other cause, which, being relieved, the infant is comfortable again in the incu-

bator. The change from the incubator to the crib must be made gradually. If the incubator is of the box pattern, the lid is removed for part of the day. If the *couveuse* has automatic heat regulation, this must not be done, as opening the doors disturbs the thermostat; here the infant is gradually accustomed to being outside by being kept in a warm crib or on the nurse's lap for longer and longer periods. After a while it is placed in the incubator only at night. and if it bears this treatment well, it is left in the crib entirely.

THE PARTICULAR DISEASES OF PREMATURE INFANTS

Premature children may have all the affections of full-term newborn infants. These illnesses are very severe, however, and the premature infant is subject to certain particular conditions.

They suffer much from anemia, and the usual remedies, iron, liver, ventriculin, cod-liver oil, haliver oil, viosterol, orange juice, etc., are prescribed,—likewise ultraviolet light.

After atelcctasis, sepsis carries away most of these mites of humanity, and the nurse's main function is to guard against it at all points of entry. The entry is through the body orifices—mouth, nose, navel, especially the last—and from the gastro-intestinal tract and lungs. Infections of the navel are rare since the antiseptic treatment of the stump is practised. Infection through the lungs is not uncommon, but is hard to diagnose, as the symptoms of pneumonia are obscure. Fever is often absent and there is no cough. A fatal epidemic of bronchitis was started in an incubator nursery in Paris from one of the wet-nurses who had caught an ordinary "cold in the head." Forty children succumbed. Infection of the gastro-intestinal tract is easy to find, since there is usually diarrhea, with sharp, irritating, green, foamy, or offensive stools, and there are often fever, tympanites, and vomiting.

The infection of the digestive tract may come from the mouth, from the air in the incubator, from the food given, from the fingers of the attendant, and from the bottles, nipples, etc., used. The importance, therefore, of absolute and constant cleanliness needs no emphasis.

The child sometimes suffers from simple indigestion. This is nearly always the case if bottle feeding is necessary. Even with mother's milk it may occur, being due to insufficient digestive power of the tract. The little organs are not sufficiently developed. The symptoms of indigestion are vomiting, loose bowels, with curds, but with less evidence of fermentation in the stools, and progressive loss of weight. In treating these cases one must be sure that the infant is not being overfed. A small feeding is given several times to see if the stomach will tolerate it. The milk must be properly diluted. The simple addition of "peptic salt" to the milk will often correct the condition. Peptic salt is made by mixing 1 part of finest table salt with 9 parts of best scale pepsin: $\frac{1}{4}$ grain is given with each feeding.

Thrush or **sprue** is commoner in premature babies than in others. It is due to uncleanness and is preventable. The treatment recommended on p. 448 is practised, but the nurse uses greater gentleness not to injure the delicate mucous membrane of the mouth.

Nasal Infection.—An affection which has been observed not infrequently at the incubator station of the Maternité in Paris, but with which we have had no experience, is an ulcerative rhinopharyngitis due to decomposition of food which the baby regurgitates into the nares. Profuse discharge from the nose, soon becoming purulent, ulceration of the mucous membrane even to the bone, with the development of "saddle-nose" similar to that of syphilis, are reported. Sometimes this infection causes a bronchopneumonia and general sepsis. The treatment is one of local cleanliness and antisepsis, which, however, is not easy to practice.

Cyanosis.—A frequent condition is what we call “cyanotic attacks” or “blue spells.” The infant suddenly ceases to breathe, turns blue, and may die unless immediate action is taken. Sometimes, however, the attack passes over and the infant regains its color, but is apparently weaker. These blue spells are due to two causes, which are directly opposite in their nature; therefore it is difficult to treat the condition. First, they are the result of weakness. Dr. O. W. Holmes says, “The little waif is too tired to pull at the twenty-four oars of respiration.” The babe simply forgets to breathe. The treatment of such a case is first to relieve the collapse by artificial respiration, a hot bath, and stimulation with a little coffee or friction. If the nose of the child is stopped up sufficient obstruction may result as to cause death.

Since the cause of the cyanotic attacks is exhaustion, it is important that the infant receive sufficient food and that it be assimilated. The feeding must begin right after birth; food should be given in small quantities, and then in increasing amounts as the stomach will tolerate it.

The other causes of the cyanotic attacks are overfeeding and choking. If the stomach is overdistended it interferes with the heart's action. Regurgitation of food may occur, when small particles may be caught in the trachea and strangle the infant.

To cure this condition it is simply necessary to recognize the cause. To prevent the child from choking, the nurse must watch it very carefully until its actions are well known, and it must be laid gently on its right side after the feeding. The child must not be left alone for a minute. In these cases the advantages of a modern incubator are apparent, as one may keep the infant under constant observation.

Should the child be found choking, the nurse must at once hold it up by the legs, and with the little finger, protected by a rubber glove, seek to remove the obstruction from the throat. If this is not successful, the chest should

be squeezed from before backward, in the manner illustrated in the section devoted to instruction for resuscitating asphyxiated babies. As a rule, these means suffice, but if they do not, the tracheal catheter must be employed to free the air-passages of obstruction. Needless to add, the accident is often fatal, owing to the delay and difficulty in dislodging particles that have onced gained access into the lungs.

The most fatal complication of premature infants is **atelectasis pulmonum**. This means that the lungs of the child have not unfolded; the air, therefore, cannot get into them, and the child nearly always dies of more or less rapid asphyxia.

Infants whose lungs have not unfolded do not become red or pink, but retain a blue color. They are often called "blue babies," although this term should be reserved for infants born with heart disease. The atelectatic baby does not cry with vigor, but whines, and each expiration is attended by a grunt or a light groan. It has cyanotic attacks. Unless the child can be made to cry vigorously and naturally and the healthy pink or red be brought back to the skin, it will almost inevitably die. Gradually it becomes unconscious, and dies in spite of every attempt to restore the natural breathing.

The means employed to cure the condition are the hot bath, getting the infant to cry by spankings and rubbings or electricity, artificial respiration, even gentle attempts to inflate the lungs with a catheter in the trachea and the use of a little oxygen tent.

Convulsions in incubator babies are due to asphyxia or to indigestion, with toxemia, sepsis, and the causes acting with full-term children. (See p. 478 for details of treatment.)

In conclusion, a few words about the desirability of saving these weakling additions to society. Mothers often ask if the children will grow up to be vigorous and strong, and the question may be answered in the affirmative. Many of

the children nursed in the incubator system at the Chicago Lying-in Hospital are being kept under observation, and are thriving. Older statistics tell of the successful rearing of these undeveloped children. Isaac Newton, Daniel Webster, and Hobbes, the philosopher were prematures, as also was George the Third, and, to emphasize all, one may recall that Victor Hugo was a premature child, and was in his own words, "colorless, sightless, voiceless, and so poor a weakling that all despaired of him save his mother."

CHAPTER VII

INFANT FEEDING

BY DR. ARTHUR F. ABT

Introduction.—In the feeding of infants we are dealing with the problem of adequate nutrition, which demands a digestible food, free from harmful bacteria, containing sufficient energy-producing materials, and also the necessary elements for normal growth and development. The energy requirement of infants is proportionally greater than that of older children and adults, and the younger the infant the higher the caloric requirement. In order that growth, body repair, and normal development may go on at an optimal rate, the food of the infant must contain the appropriate amounts and quality of the adequate materials or building stones necessary for these processes.

The best gauge which we have for the adequate nutrition of the infant, is to be found in the character and type of his growth. There is normally a considerable variation among healthy infants in the rate of growth which is due to both hereditary and nutritional factors. Babies of healthy parents, given sufficient quantities of foodstuffs of the correct quality should thrive and attain the maximal potentialities of their growth and development.

Milk as a Food.—Since milk is the only source of nutrition for the infant, especially during the early months of life, it is natural to expect that it must contain all the substances which are necessary for both the maintenance and the growth of the body. An analysis of milk shows this to be true. Milk contains proteins and salts which provide for the maintenance and growth of the infant organism, and also fats and carbohydrates which supply

energy and heat to the body. Not only are all four substances, salts, proteins, fats, and carbohydrates present in milk, but they are found in such an ideal form that no substitute for milk as a food for babies has yet been discovered. Milk also contains sufficient water to satisfy the baby's needs, and vitamins are normally present in varying degrees in different milks.

In every animal that suckles its young, nature has provided special glands (mammary glands—breasts) whose main function it is to supply milk. In most animals milk is only produced when the young are born. In general all milks are white in color, of slight characteristic odor and of sweet taste. The nutritive substances of milk are of such quality as is encountered nowhere else in either animals or plants.

Proteins.—The chief protein substance of milk is casein. All milk when entering the stomach is immediately brought into contact with the gastric juices which contain acid, and a ferment called “rennin.” The action of acid and rennin causes the casein portion of the milk to coagulate and form curds. Curds of milk from different species of animals and from different individuals of the same species have been tested and have been found to have different degrees of toughness. The actual testing of the curd gives us a definite “curd tension,” which in cow's milk varies from 16 to 140 grams. Any milk with a curd tension of less than 30 grams is called a soft curd milk and any over this value a hard curd milk. When milk is acidified, boiled or evaporated previous to ingestion, the curd is softened. Breast milk, and cow's milk either evaporated, boiled or acidified, are of the soft curd type. Cow's milk contains more casein than breast milk. The functions of protein in body metabolism are to replace used proteins, to satisfy cell growth, and, when given in excess, to furnish fuel for energy to the body.

Fats.—Fat is present in the form of fine droplets. When milk stands these fat globules rise to the top because they

are very light and on the surface of the milk form the fatty cream layer. Milk fats contain volatile fatty acids, which give cow's milk and butter their peculiar odor and taste. The ingested fat is absorbed and is used to supply the fatty tissues of the body, such as the subcutaneous fat. Any excess of fat absorbed is burned in the body for fuel or energy.

Carbohydrate.—Milk sugar, or lactose, is also very characteristic and is found nowhere else in nature. After absorption, sugar is used for energy and may also be stored as glycogen in the liver and muscles. This furnishes the body with a reserve supply for emergency use. Fat may also be formed from sugar in the body by the subcutaneous cells.

Salts.—Infants need minerals for growth as well as for life. Milk provides these minerals in the form of salts, the most important being the calcium (Ca), phosphorus (P), and sodium (Na) salts. Bones owe their firmness to the presence of both calcium and phosphorus. To supply this need milk contains rather large quantities of calcium and phosphorus salts. Striking and worthy of special note is the fact that practically no iron is present in milk. This is remarkable because iron is essential for blood building.

Water.—The infant's fluid requirement is variable and depends upon its age, activity, and the outside temperature. Except during periods of excessive heat, or during illness with fever or diarrhea, the following fluid requirements will be found adequate: For the infant during the first weeks of life, one-fifth of its body weight of fluid per twenty-four hours; one-seventh of its body weight of fluid at six months; and one-eighth of its body weight up to the first year.

Intake of water is in the food, and excretion is from the kidneys, bowels, lungs, and skin. About 1 to 2 per cent of the water ingested is retained in the body.

Vitamins.—The vitamins A, B, C, and D are normally present in human and cow's milk. Vitamins A and D may

be added in the form of cod-liver oil, and an extra supply of vitamin C is obtained from orange juice. There is probably sufficient vitamin B in the milk to meet the infant's requirements.

Breast Milk Ideal Food for Infants.—Breast fed infants thrive better, resist sickness better and accordingly have a lower mortality than the bottle fed baby. One would hardly believe that a healthy woman would refuse to nurse her child, yet it is true now and has been for centuries. Caesar reproached the Roman women for giving their children to mercenary nurses, and moralists of all epochs have contended against the practice. Aulus Gellius in his *Attic Nights*; Erasmus in his *Colloquies*; Montaigne in his *Essays*, and many others in addition to physicians refer to and condemn the custom. It has been said that no man became great who was raised on the bottle.

The modern woman, however, is recognizing more and more the right of her babe to her personal care and to be nourished at her own breasts. The argument of the ancient philosophers is triumphing at last. Nowadays the mother considers it little less than a calamity when she cannot nurse her infant. Unfortunately many women have undeveloped breasts or a gland that secretes nothing, or nipples that a child cannot grasp; or her general health is so poor, from tuberculosis for example, that nursing is impossible. In these cases a wet nurse must be employed.

Contraindications to Maternal Nursing.—Active pulmonary tuberculosis in the mother is an absolute contraindication. Inactive or bone tuberculosis contraindicates nursing only if the mother's condition is poor and the health of the mother thereby endangered. Epilepsy or insanity should prohibit the mother from nursing if there is danger of injury to the baby. In such cases, where practicable the milk should be expressed by an attendant. The toxemias of pregnancy contraindicate breast feeding for the first few days only and the amount of milk given at first

should be very small, to find out if it is poisonous. Other debilitating diseases of the mother; as cardiac disease, anemia, postpartum hemorrhage, malignancy, typhoid, etc., are only relative or temporary contraindications, depending upon the mother's condition. The baby should be removed from the breast during the infectious period of any of the contagious diseases from which the mother may be suffering, such as, small-pox, scarlet fever, measles, chicken-pox, whooping cough, mumps and diphtheria.

Syphilis is a contraindication if the mother is actively luetic and the baby shows no evidence of lues. It is not a contraindication if the mother is Wassermann negative at the time of lactation, or if vigorous anti-luetic treatment has been instituted during pregnancy.

Pregnancy, menstruation, a history of failure to nurse previous babies and "colic" are never contraindications to nurse a baby. Rarely mothers' milk will not agree with a baby, that is an "idiosyncrasy to mothers' milk." Its occurrence is so seldom that for practical purposes it can be almost overlooked.

A breast abscess does not affect the milk, and even if pus is present it does not always affect the baby. It is wise however not to let the infant nurse and surgeons may insist on "drying" the breast to promote recovery.

Malformations of the breast as absence of nipples or inverted nipples may prevent nursing at the breast. In a like manner malformations in the mouth of the child, as hare lip and cleft palate may interfere with the nursing of the child.

Activity of the Breast.—In the first days after birth the secretion of the breast is small in amount and consists of the viscid, yellow colostrum. On the third or fourth day the breast becomes filled. We say that the milk "shoots in." The breast is firm, large, hard and there is a feeling of tension. The tension may be so great as to cause discomfort. From day to day the function of the breast improves and produces more milk. It is contingent, however, upon

the necessary stimulation which is the nursing child. When the milk is not used the milk production stops, the gland retrogresses and the ability to secrete disappears. The enemy of the breast is milk stagnation. If a portion of the milk remains, or if the breast becomes congested, its action is more slowly established. It is necessary that the breast be emptied four or five times daily in order to maintain its function.

Quantity of Milk in a Breast.—The quantity of milk that can be obtained from a woman is much greater than is commonly believed. A liter per day can very easily be procured. Milk production in unusual cases can even reach two to three liters in twenty-four hours.

The Size of the Feeding at the Breast.—This is dependent upon the need of the child and the efficiency of the breast. If the breast secretes only moderately then it depends upon the child; if it suckles energetically the breast will deliver profusely, if it suckles less strongly then it secretes less. The functioning of the breast is also an important factor. If a breast secretes readily the child will drink more than if he has to work to secure the milk. The child gets its greatest feeding in the morning, because having rested it has more strength to suckle and the breast having had a long interval of inaction, flows more profusely. For the other meals of the day there is no special rule. The quantity at each feeding can vary within wide limits. Usually the deficiency at one meal is made up at another.

Factors Which Influence Breast Milk.—There is nothing which produces an appreciable influence on either the quality or quantity of breast milk. Dietetic variations within normal limits have little effect upon the milk supply. Foods which have been recommended for this purpose, as milk, malt extract, cocoa, etc., have no demonstrable influence. A high fat diet may temporarily increase the fat content. Rarely foods which disagree with the mother may alter

the composition by effecting the whole organism of the mother. Starvation of the mother will reduce the quantity of milk but tends to increase the fat percentage. A large intake of fluid has little effect upon the milk supply but a fluid intake below the metabolic needs of the mother will cause a diminution.

Psychic influences, as aggravation, fright, worry and fear do not influence the milk quality, but the quantity may be considerably diminished. On the other hand the love of the child, the desire to nurse, is a great influence in the efficiency of the breast. Where there is a will there is a way. If a mother wants to nurse her child, it is a great aid in milk secretion; if a mother does not want to nurse her child, it will hinder her milk production.

Just as there is no food that will increase the milk supply so there is no medicine that will increase the quantity. If a mother loses her appetite a stimulating tonic can indirectly influence the production of milk. A direct influence on milk has, up to the present, not been demonstrated.

Pregnancy and menstruation do not influence the quality of the milk, though the quantity may be somewhat reduced.

Certain drugs, potassium iodide, sodium salicylate, aspirin, mercury (as calomel), antipyrin, arsenic, bromides, urotropin, alcohol, if taken in large amounts, opiates, (not demonstrable in milk, but have an effect on the baby), when ingested by the mother may appear in the milk and so effect the baby.

Nursing Technic.—Under natural circumstances one will hardly have occasion to give advice in the technic of nursing. The infant takes the breast instinctively and drinks without the necessity of being taught, and the mother needs no instruction either. But today nursing for most mothers is not a natural procedure so that it becomes necessary to give advice and training in the matter.

Preparation for lactation takes place in the time before

birth. Well kept nipples are absolutely essential. (See page 235.)

While nursing in the lying position the mother can rest on her side supported by a pillow. When the mother is out of bed she sits best on a low stool and supports with her knee the arm which holds the child (Fig. 94). The free hand is then used to help the child with the breast. She is shown how to retract the parenchyma of the breast from the nipple, so that the infant's nose will not be buried in the mamma, and respiration will not be obstructed in this manner. If she trains the baby to grasp the areola as well as the nipple, the milk flows more freely and the nipple is less liable to be traumatized and rendered painful. The nipples should be kept scrupulously clean and may be washed before nursing, using plain sterile water, certainly not strong antiseptics.

Duration and Intervals of Feeding.—The child should be nursed on only one side at a feeding. This gives each breast a longer rest period and at the same time it is better emptied. Only in special cases where the quantity of milk is insufficient may the child be put to both breasts.

Normally the length of a nursing period is determined by the child itself. When it has taken sufficient milk it lets the breast go. Satisfied, and tired by the exertion of drinking it immediately falls asleep.

Such is the status in the first quarter year of life. If one wishes to fix the duration of a feeding, one should remember it is useless to continue nursing longer than 15 or 20 minutes. It has been conclusively shown that the breast is 80 per cent emptied in the first 12 minutes. Nursing longer undoubtedly exhausts both the baby and the mother. In the interval between feedings the child as a rule sleeps. In this manner, very early, the child can be put on long feeding intervals. In the first few months especially, sleep is very deep. Most children unless trained improperly,

of their own accord, take only five and at the most six feedings in a day.

Complementary and Supplementary Feeding.—A complementary feeding is one which is given after a breast feeding insufficient in quantity. A supplementary feeding is one which entirely replaces a breast feeding.

Overfeeding at the Breast.—Overfeeding is a frequent cause of alimentary disturbance in nurslings and may result in injury to the organism.

Nearly every mother primarily interprets the cry of her infant as due to hunger. If the mother yields to her feelings and feeds the baby every time it cries, a condition of overfeeding readily occurs. In those cases where the milk secretion is over abundant, and the infant is very vigorous, overfeeding may occur before it is noticed. Overfeeding leads to restlessness, disturbed sleep, occasional vomiting, flatulence and increase in the number of stools which are dyspeptic in character. The weight curve remains stationary or drops. In this connection it is an important duty of the nurse to impress upon the mother the dangers of irregularity in feeding or keeping the child at the breast too long. The nurse should teach the mother to nurse her babe punctually and to keep it at the breast 15 or 20 minutes by the clock.

Underfeeding at the Breast.—As great as is the danger of overfeeding, equally serious are the results of underfeeding at the breast. The breast milk may be insufficient, or in rare instances, it may be of poor quality. Sometimes the baby is weak and does not help himself, or the breasts may be difficult to empty.

An underfed baby becomes restless, the skin becomes pale, he fails to gain in weight and cries almost constantly. If the baby is receiving insufficient food, a properly prescribed formula should be given after each nursing, but the baby should be kept at the breast as long as there is any milk. Such a formula is known as a complementary feeding.

One not infrequently finds that during the early days of life the loss of weight resulting from underfeeding is associated with fever. It was Holt who first suggested that the febrile reaction was an inanition fever. We know, however, that during the early period of life there is a great loss of water from the body and the fever is often abruptly terminated when the infant receives an abundance of water. The underfeeding of breast-fed infants is largely influenced by the water intake. The nurse should know that infants who receive sufficient water are less likely to feel the effects of the underfeeding than those who are receiving insufficient water.

Chemical Examination of Breast Milk.—This procedure which has been extensively resorted to by clinicians in order to determine whether the milk was of the proper chemical composition, and also if it was suitable for the infant, has fallen into disuse. Clinicians themselves know that milks which gave an average or normal result in analysis, disagreed with the baby, while milk which responded unfavorably to chemical tests with low fats or high proteins, frequently agreed better. In cases, however, where the physician has ordered milk for chemical analysis, at least two ounces are needed. This is obtained with a breast pump which has been previously boiled in plain water. Take one ounce before the nursing and one ounce after in separate bottles. The best time is between 9 and 10 A. M. The milk is poured into a clean sterile bottle, corked (not with cotton), and sent to the laboratory. The best test of the quality of the milk is, as has been mentioned, the condition of the child.

Artificial Feeding.—Natural feeding is breast feeding; every substitute for breast feeding is artificial feeding. There is no perfect substitute for mothers' milk. When we raise a child on the bottle, it should be our aim to imitate its natural food and try to offer it the food as nearly as

possible under the same conditions as it is obtained at the breast.

The best substitute for mothers' milk is animal milk. The chief nutritive substances—salts, proteins, fats, carbohydrates, salts, water, and vitamins—are present in all kinds of milk. But a comparison of the analysis of the milk of different animals will show us that these substances are present in different quantities in each kind of milk. Accordingly in a comparison of human, cows', goats', and asses' milk, we find that cows' milk has the highest protein content, asses' milk the lowest fat content, human milk the highest sugar percentage and goats' milk the highest value for salts.

Differences in Composition of Human and Cows' Milk.—The composition of mothers' and cows' milk is indicated in the following table:

	Cows'	Human
Protein.....	3.5 per cent	1.15 per cent
Fat.....	3.5 to 4 per cent	3.5 per cent
Carbohydrate.....	4 to 5 per cent	7.0 per cent
Salts.....	0.75 per cent	0.20 per cent

From the above table it can be seen that mothers' milk is poorer in substances which provide building materials—the proteins; and richer in the products for combustion—the carbohydrates. But these are not the only differences. The proteins of cows' milk and human milk are not identically the same. They differ in kind. In a like manner the fats of the two milks are not exactly the same. Correspondingly there are also differences in the salts. Only the milk sugar, which is identical in every kind of milk, is the same in both human and cows' milk.

Even gross differences in the two milks can be noticed. Breast milk is thinner and paler than cows' milk. Cows' milk produces large light curds while human milk produces fine flocculent curds. Mothers' milk is comparatively

sterile, while cows' milk always contains bacteria. A child at breast is supplied through its natural food with vitamins and immune bodies. The latter aid the baby in resisting infection.

From the few differences between cows' and mothers' milk which have been indicated, it can readily be seen that equal quantities of cows' milk can not be substituted for equal quantities of mothers' milk. We can, however, through mixtures, [known as modifying the milk], approach the composition of mothers' milk. This attempt to imitate the natural food and adapt the artificial food to the needs of the baby is the aim of formula writing.

THEORETICAL BASIS FOR MODIFICATION OF COW'S MILK

The best guide to the optimal proportions, in the modification of cow's milk, is that of breast milk, in which protein, fat, and carbohydrates are in the percentages of 1, 3, 5, and 7. The most important relationship in this proportion is probably the 1 : 2 ratio between fat and carbohydrate. Fat restricts, while carbohydrate favors water retention; fat causes water to be stabilized in the body, while carbohydrate causes water-labile conditions. Fat increases immunity, while carbohydrate in too great proportions decreases it. Increases in fat may be made if this 1 : 2 ratio is maintained.

Besides maintaining this fat to carbohydrate ratio, it has been found that the infant will require from $1\frac{1}{2}$ to 2 ounces of cow's milk per pound of body weight; he will require approximately 1/10 ounce of carbohydrate per pound of his weight, and his fluid requirement will be one-fifth of the body weight to six months, one-seventh at that age, and one-eighth up to the first year.

It must be remembered that variations are often necessary in the individual case; that tolerance is low in the first weeks of life; that unusually large or robust babies may require increases in all of the elements of the formula,

and that in underweight babies the feeding is computed on what they should weigh, and not for what they do weigh.

Rules for Formula Writing.—Most formulae are simple mixtures of milk and water with the addition of sugar. The proportions of each are determined by the following rules which are the results of years of both laboratory and clinical investigation and very careful application:

1. The average healthy, normal child will be contented with five feedings per day after two months. Omitting night feedings, and allowing a four hour interval, the most convenient schedule is, 6:00 A. M.—10:00 A. M.—2:00 P. M.—6:00 P. M.—10:00 P. M. The night feeding at 2:00 A. M. given during the early days of life, can usually be discontinued very soon.

2. The quantity at each feeding in ounces, can be determined by taking the age in months and adding two:

Example: Baby aged 3 months, quantity at each feeding is $3 + 2$ or 5 oz.

3. The total volume of a day's formula equals the number of feedings, times the quantity in each feeding.

Example: 5 feedings daily, 5 ounces each feeding, $5 \times 5 = 25$ ounces, the volume of total formula.

4. The milk requirements of a baby are $1\frac{1}{2}$ ounces of cows' milk per pound of body weight per day.

Example: A baby weighs 10 lbs. Milk required for baby's formula = $10 \times 1\frac{1}{2}$ ounces = 15 ounces of cows' milk per day.

5. Water required in the formula is the difference between total volume in formula and milk required by baby.

Example: 25 oz. = total volume of formula.
 $\underline{-15}$ " = milk required for one day.
 10 oz. = water required for formula.

6. Sugar required by baby is $\frac{1}{10}$ oz. per pound of body weight, but not exceeding $1\frac{1}{2}$ oz. per day.

Example: 10 lb. baby, requires, $10 \times \frac{1}{10}$ oz. = 1 ounce sugar per day.

Sugar values in tablespoons.

Dextri-maltose.....	3 tablespoons = 1 ounce. .
Cane sugar.....	2 tablespoons = 1 ounce.
Lactose.....	3 tablespoons = 1 ounce.
Karo syrup.....	2 tablespoons = 1 ounce.

7. Caloric requirements per day are 45 calories per pound of body weight. When a formula is prescribed the caloric value of each ingredient must be determined and from the total, the number of calories per pound of body weight should be estimated to ascertain whether the food requirements are adequate for the metabolism and growth of the organism. See complete example which follows.

8. The total fluid intake per day should be a minimum of 3 ounces of fluids per pound of body weight.

Example: Formula for a three month old baby weighing 10 lbs.

- Rule 1. 5 feedings per day.
6—10—2—6—10
- Rule 2. Quantity at each feeding in ounces.
Age in months $3 + 2 = 5$ ounces per feeding.
- Rule 3. $5 \times 5 = 25$ ounces total for day.
- Rule 4. $10 \times 1\frac{1}{2}$ oz. = 15 ounces milk.
- Rule 5. 25 ounces
—15 ounces
10 ounces total water in formula.
- Rule 6. Sugar— $10 \times \frac{1}{10}$ oz. = 1 ounce in formula.

Formula is

Milk.....	15 ounces
Water.....	10 ounces
	<hr/> 25 ounces
Sugar.....	1 ounce
Divide into 5 bottles—5 ounces each.	

Rule 7. 15×20 calories (for each ounce of milk) = 300 calories.

1×110 calories = 110 calories for sugar.

$300 + 110 = 410$ calories in total formula.

$410 \div 10$ (lbs.) = 41 calories per lb. of body weight which for practical purposes is sufficiently accurate.

Rule 8. Total fluids.

10×3 oz. = 30 oz. required per day.

Minus fluid in formula, 25 ounces = 5 ounces additional water to be given between feedings.

Preparation of the Formula.—Shake the unopened bottle of milk in order to mix thoroughly. The lip of the bottle should then be cleaned with a sterile cloth and the milk required for the total day's feeding (that is, the amount determined in the formula) should be measured in a graduate and from there poured into a clean container, either single or double boiler. The diluent which is usually sterile water (water which has been boiled on the open fire for 30 minutes) is then measured out and added to the milk. The mixture is brought to a boil constantly stirring. Over the direct flame it takes 3 to 5 minutes. In a double boiler it takes 20 to 30 minutes. The scum should be removed.

The required amount of sugar should be measured with a sterile measuring spoon or an ounce graduate. If cane sugar or lactose is used it can be stirred directly into the mixture as it is removed from the fire. If dextri-maltose is used the required amount is put into a sterile cup and a paste is made with sterile cold water. After the milk has been boiled the paste is added.

The hot food is then poured through a sterile funnel into sterile nursing bottles. Only pour as much as is necessary for one feeding into each bottle. Cork with sterile cotton, cool rapidly with cold water and place in the ice box. During the hot weather it is very important to be certain that the refrigerator is cooling properly. The safest procedure is to keep an ordinary room thermometer

in the refrigerator and see that the temperature registers between 40 and 45 F.

The Nursing Bottle and Nipple.—Any bottle that can be easily and thoroughly cleaned and with a neck that will fit the nipple can be used, but a smooth, round bottle graduated up to 8 ounces is preferred.

The bottle should be emptied of any remaining milk immediately after feeding and filled with cold water. Later it should be scrubbed with soap suds and a bottle brush and then thoroughly rinsed. All used bottles just before the preparation of the next formula should be boiled to sterilize them.

Any simple, easily evertible, easily cleaned nipple of rubber or gelatin preparation can be used. The consistency of the nipple must be adapted to the baby. A vigorous nurser needs a stiff nipple. Nipples can be softened by boiling. The nipple holes can be enlarged with a red hot needle if necessary to allow the milk to drip readily, but not to flow in a stream.

The nipples should be washed thoroughly immediately after each using and boiled. They should be everted to wash the inside. It is important to see that no milk remains in the nipple holes. The supply should be kept in a clean sterile, dry glass container. Never use a nipple twice without cleaning. Never use the same nipple for another baby without thorough sterilization by boiling or steaming.

Technic of Feeding.—The bottle and contents should be warmed to body temperature by placing in warm (not hot) water. The cotton stopper should be removed and the nipple attached. In attaching the nipple great care should be exercised to avoid touching either the lip of the bottle or the free end of the nipple. Otherwise contamination may result and the baby become infected. The temperature of the contents can be tested by allowing a few drops to fall on the inner surface of the forearm or the wrist. The

baby is held in a semi-recumbent position and the bottle held as horizontal as is compatible with keeping the nipple filled. The long axis of the nipple should always be parallel to the long axis of the baby's tongue and one must be careful that the nipple does not extend too far into the baby's mouth. If the nipple touches the anterior or post pharyngeal wall or the uvula the baby may vomit. If the baby does not nurse one may stimulate suction by partially and slowly withdrawing the nipple. Do not allow the baby to chew or otherwise "play with" the nipple. It can not be too emphatically impressed upon the nurse that she should never leave the bottle in bed with the baby. The bottle must always be held until the baby has finished and then removed at once. A maximum of twenty minutes should be allowed for a feeding. After feeding the baby should be held upright on the shoulder to facilitate belching of swallowed air. In babies who swallow much air this may also be necessary midway through the feeding, while in thumb suckers this may be necessary before feeding. In some babies "holding to belch" increases the tendency to regurgitate. These babies should be fed in their crib and not held to belch.

Additions to the Infant's Diet.—Recently we have broadened the early milk diet by giving cod-liver oil, orange juice, cereals, vegetable soup, puréed vegetables, liver and various other foods. It has been found that a reduction of the amount of milk, and the timely addition of a generous variety of food substances containing minerals, fats, vitamins, and proteins are greatly lessening the incidence of nutritional anemias, and are eliminating overfat, pasty babies, with poor muscle tone. Often these babies developed beside anemia, large livers and spleens, signs of rickets, and poor resistance to infection.

Orange juice and cod-liver oil are added to the diet as early as the first month of life and gradually increased in amounts as the infant grows. Three teaspoonfuls daily of

a standardized cod-liver oil will protect the infant against rickets, and 1 ounce of orange juice daily will protect against scurvy. The early addition of these vitamin substances has been generally employed in breast fed as well as bottle fed babies.

Cereal foods are commenced at four months of age, and continued throughout the first year, being given first at one feeding daily, and later at two. Vegetable soups and purées are commenced at five to six months of age, and liver is added either in the soup or as a separate feeding after the sixth month. At about the eighth month stewed fruits and puddings, as gelatin, junket, cornstarch and tapioca are begun. In the last third of the first year, bacon, jellies, cheese, honey, and raw fruits, such as bananas and apples, are added.

Eggs are added to the diet with great caution. Egg contains protein substances to which some babies may be extremely sensitive. Even a few drops of egg may cause such a baby to become violently ill, with vomiting, eruption of the skin, and hives or wheals. I have known a baby to become suddenly blue, swell up with huge urticarial wheals and develop asthmatic breathing, when given an egg for the first time. Therefore, though some recommend the addition of egg yolk in the very early months, the careful addition of egg, starting with minute quantities and increasing the amounts given carefully from the age of one year to fifteen months, has proved the safest method.

Details for the preparation of cereal foods and vegetable soup will be found in a following page.

Certified Milk.—Certified milk, also sometimes called “Baby milk” is preferable in feeding infants because of its cleanliness and low bacterial count. The bacterial count per cc. should not exceed 10,000 and the fat content should be at least 4 per cent. This milk is produced from healthy cows which have been tested to exclude tuberculosis and bacillus abortus. The cows are kept under the

most hygienic conditions and the utmost cleanliness is observed in milking. The stables, cows' udders, hands, pails, bottles and other utensils with which the milk comes in contact from the time it leaves the producer until it reaches the consumers are guarded most scrupulously against contamination. Immediately after milking, the milk is cooled to a low point, and kept at a low temperature until delivered to the consumer. All the specified requirements for certified milk are controlled by the Milk Commission.

Recently, certified vitamin D milk has been introduced. This milk is prepared in the same manner as regular certified milk, but in addition the cows are fed irradiated yeast for a given period of time, which causes an increase of the vitamin D content of the milk.

Pasteurized Milk.—By the process of pasteurization the milk is slowly passed through a succession of vats, being held at a temperature of about 150 F. for thirty or forty minutes. It is afterward cooled, then drawn into sterilized containers and bottled. The necessity of keeping pasteurized milk cold and of using it within twenty-four hours must be recognized. It should be known that, unless milk is kept cold and used soon, it may, even though pasteurized, contain an immense number of bacteria and yet it may not turn sour.

Buttermilk.—The old-fashioned buttermilk was a by-product of butter production. To-day the greater demands for buttermilk are being supplied by skimmed, lactic acid milk. Both products, the old-fashioned buttermilk and skimmed lactic acid milk are identical except that the former is a natural product of butter while the latter is artificially prepared by the inoculation of skimmed milk with bacilli of the lactic acid group. The skimmed lactic acid milk is also produced by adding to 1 quart of cooled skimmed milk 2 drams of U. S. P. lactic acid, stirring constantly while the lactic acid is added very slowly. Skimmed lactic acid milk can also be secured in convenient

powdered form. The powdered product should be diluted, 1 tablespoonful of the powder to 2 ounces of water.

Whole Lactic Acid Milk.—This milk is prepared in the same way as skimmed lactic acid milk, except that whole milk is used. Whole lactic acid milk is also marketed in powder form. It should be diluted one tablespoonful to two ounces of water.

Protein Milk.—This is also known as albumin or Eiweiss milk. It was first devised by Professor Finkelstein of Berlin. It is prepared as follows:

To 1 quart of milk some form of rennin is added and kept at 100 F. for twenty to thirty minutes until well coagulated. The curd is gently broken up and poured into a small muslin bag and in this it is suspended and allowed to drain for one hour. The whey is discarded and the curd is rubbed three to four times with a pestle or spoon through a very fine sieve. To this mixture is added 1 pint of buttermilk and 1 pint of water. The whole mixture is brought to a boil and kept there for a short time. Already prepared protein milk is on the market as a powder to which water and sugar are added as ordered by the physician.

Evaporated Milk.—In the preparation of this product, fresh mixed herd milk is treated in a partial vacuum until about 60 per cent of the water is removed. The resulting concentrated product is then treated so that the fat globules are broken up into small particles of nearly colloidal size. This causes the fat droplets to remain equally distributed throughout the milk, so that they do not rise to the surface to form a cream layer. The milk is then hermetically sealed in cans and autoclaved at 240 F., resulting in a sterile product.

Evaporated milk may be considered to have twice the strength of cow's milk. If an equal volume of water is added, we obtain a milk practically equal in strength to fresh whole milk. Evaporated milk is a sterile, soft curd milk, and when diluted with an equal volume of boiled water may be used

for the preparation of infant formulas in exactly the same manner as whole cow's milk.

Condensed Milk.—In this milk the fat has been removed and cane sugar added. It is a highly concentrated product and should be diluted at least 1-16 before using. It is valuable to complement breast feeding, when one wishes to have a small infant gain rapidly. It cannot be used as a complete artificial feeding because of the low protein and high sugar content. Babies fed entirely on this milk become fat and flabby.

Dried Milks.—These are ordinary milks from which all the water has been removed through a special process of evaporation. There are a number of products on the market appearing under such trade names, as, Klim, etc. Dryco is half skimmed milk evaporated to powder form.

S. M. A.—This is a fat free powdered milk to which are added vegetable oils; as cocoa butter, cocoanut oil, cod liver oil etc.

The Milk Foods.—Nestle's food is perhaps the most widely known. The milk foods are essentially sweetened condensed milk evaporated to dryness, with the addition of some form of flour which has been dextrinized; they all contain a considerable portion of unchanged starch.

The Liebig or Malted Foods.—Mellin's food may be taken as a type of the class. Others which resemble it more or less closely are Horlick's and other malted milks. Mellin's food is composed principally (80 per cent) of soluble carbohydrates. They are derived from malted wheat and barley flour, and are composed chiefly of a mixture of dextrans, dextrose and maltose.

The Farinaceous Foods.—These are imperial granum, Ridge's food, Hubbell's prepared wheat and Robinson's patent barley. The first consists of wheat flour previously prepared by baking, by which a small proportion of the starch has been converted into dextrin or sugar. In chem-

ical composition these four foods are very similar, consisting mainly of unchanged starch which forms from 75 to 80 per cent of their solid constituents.

Goats' Milk.—This milk has no advantage in its use over cows' milk except that it is always free of tubercle bacilli without pasteurization. Its use is more general

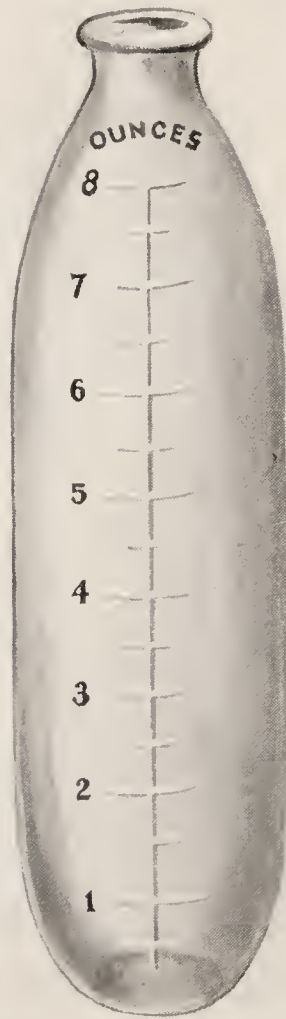


Fig. 242.—A hygienic nursing bottle.

in European and Asiatic countries where goat raising is more common. In this country, however, because of the infrequent demand, it is comparatively expensive. Its use over a long period may cause severe anemia.

Barley, Rice, Wheat or Oatmeal Water, Etc.—These are prepared by using the flour of these cereals,—1 even tablespoonful to 12 ounces of water, and cooking for

twenty minutes. Their food value is very low, being but 2 calories to the ounce.

Cereals.—These are made by mixing the grain flour with equal parts of water and milk in the proportions of 1 ounce ($2\frac{1}{2}$ tablespoonfuls) to 10 to 12 ounces, cooking and stirring well in an open pan for fifteen minutes and then for one to two hours in a double boiler.



Fig. 243.—Some nursing bottles of ancient times: a, Probably the first, a simple horn; b, early Greek (pottery); c, early Roman (pottery); d, old Holland (pewter); e, French (porcelain); f, provincial French (wood); h, French (glass). The nipple, before the invention of rubber, was made of linen cloth.

The caloric value of cereal so prepared will equal approximately 20 calories to the ounce.

Vegetable Soup.—A vegetable soup for infants may be prepared as follows:

To $\frac{1}{4}$ to $\frac{1}{2}$ pound of lamb, or beef or chicken, or veal or a lamb bone, and $\frac{1}{4}$ pound of chicken or calf's liver cut into

small pieces, add 2 quarts of water. Cook slowly for two hours, then add 1 potato, 1 tomato, 2 carrots, 2 stalks of celery, cut into small pieces, 1 tablespoonful pearl barley, 1 tablespoonful rice, cook slowly for one more hour, then strain through a fine sieve, mashing all the vegetables, cereal and liver through strainer. This may be kept for two or three days. Remove fatty scum when cool.

Vegetable Purée.—Vegetables of any kind may be used except those highly flavored or aromatic, as radishes, cucumbers, onions, etc. The vegetables collected, such as potatoes, carrots, celery, spinach, peas, etc., should be carefully washed, cut up in pieces not larger than $\frac{1}{4}$ inch in diameter, or they may be ground in a small mill. They are then covered with sufficient water, placed on stove and allowed to cook thoroughly. Additional water may be added from time to time and the surface skimmed as may be necessary.

The water in which the vegetables are cooked can be used for making the vegetable soup.

The material is then passed through a fine sieve and all the coarse particles discarded and the resulting mass is cooked again until it is as thick as an ordinary thick soup.

Vitamins.—Vitamins are accessory food substances which are essential to growth. There are several groups, vitamin A, fat soluble; vitamin B, water soluble; vitamin C, water soluble; vitamin D, fat soluble; vitamin E or X; all of which are found in fresh fruits and vegetables, grain, eggs, potatoes and cod-liver oil. In infants we supply all the vitamin needs through the administration of cod-liver oil and orange juice, which should be started as early as the first month. Irradiated ergosterol is now being used as a substitute for cod-liver oil in special cases. It is known as Viosterol.

Growth and Development.—In the introduction to this chapter it was stated that the most accurate guide for the adequate nutrition of the infant was his growth and de-

velopment. A brief summary of the average normal values for the changes in the infant's weight and length during the first year, together with the time for the eruption of the teeth and muscular development and co-ordination, may here be stated.

The average birth weight is 7 pounds, boys being slightly heavier than girls. An initial weight loss of about one-tenth of the body weight occurs in the first three days of life, and the birth weight is regained in from ten to fourteen days. Thereafter, the infant gains regularly from 6 to 8 ounces per week for the first six months and 4 to 5 ounces weekly for the second half of the first year. The birth weight is doubled at five to six months, and tripled at one year. These are average figures and do not apply to babies much over or under the 7-pound birth weight.

The length of the baby increases most rapidly during the first six months, and the normal average growth for the first year is 8 to 8.5 inches (20.5 inches at birth and 28.5 at one year).

The first tooth usually appears at the sixth to seventh month and eight teeth are present at one year. Normal limits for the appearance of the first tooth will vary from three to four months to ten or eleven months of age. (An infant may be born with one or several teeth.)

The baby grasps objects at the fifth week, holds his head erect at four months, sits alone at six to eight months, stands at ten months, creeps at ten to twelve months, and walks at from one year to eighteen months. Most babies begin to say a few words at from ten to fourteen months, girls being as a rule earlier talkers than boys.

APPENDIX

VISITING NURSING IN OBSTETRIC PRACTICE

IN many large cities eleemosynary visiting nurses' associations provide for the home care of poor women who cannot leave their families to go to a maternity for confinement. This is really a great boon for poor women, and is a long step in the direction of good obstetrics. The question of providing proper maternity care for the rural districts is now engrossing the attention of the profession, and, without doubt, the trained nurse will take a leading part in its solution.

Care During Labor Among the Destitute.—It would seem impossible to obtain anything like aseptic results in the hovels and the country huts in which many children are born, yet, with a little trouble, by simplifying the methods, one may do as successful work in such practice as in the best maternity. This is proved by the record of the Chicago Lying-in Hospital and Dispensary, where, out of 35,000 consecutive labor cases treated exclusively by the officers of the institution in the houses of the poorest of Chicago, only 10 women have died from puerperal infection.

If visiting nurses are to help poor women at the time of labor it is necessary to provide certain aids for good work, though one can improvise everything but soap and water. The things requisite are taken to the case in a large satchel, or two smaller ones. Figure 244 shows the contents of the one used in the service of the Chicago Maternity Center, and with but little modification it could be adapted to rural practice.

LIST OF ARTICLES IN LABOR SACHEL

Two pairs rubber gloves.

One pair leggings.

One jar sterile cotton pledgets.

One jar sterile pads, and cord dressing.
 Four milk pans of graniteware (2 quarts, 2 pints).
 Two sterile brushes, one box green soap.
 Two towels.
 One newspaper.
 One ounce fluidextract of ergot.
 One bottle salt solution.
 One bottle lysol.
 One bottle bichlorid tablets.
 One bottle tape for cord (sterile).
 Nitrate of silver solution in ampules.
 One pair scissors.



Fig. 244.—The labor satchel and its contents.

Two artery forceps.
 One baby scale.
 One measuring tape.
 One pelvimeter.
 One tracheal catheter.
 One sterile soft-rubber catheter.
 One douche-can with tube and point (sterile).
 One apron.
 One labor record, one birth return, one visiting nurse's record.
 The second satchel contains:
 One jar of pledgets.
 One jar of pads with extra cord-tie.

One box green soap.

One sterile brush—in bag.

Three mouth covers.

One apron.

One stethoscope.

One blood-pressure apparatus.

One small basin.

One pair of gloves in bag.

One safety razor. Talcum. Ergot. Lysol. Bichlorid tablets. Alcohol. Lubricating jelly.

One hypodermic set, short and long needles.

Ampules: Pituitary, 2; gynergen, 2; alpha lobeline, 1.

Also instruments, etc., for local anesthesia.

On arrival at the parturient's house, the patient is prepared by giving an enema, then shaving the pudendal hair, thorough scrubbing with soap and water from ensiform to knees, followed by a wash with 1 : 1000 bichlorid. A clean nightdress and wrapper are put on the patient and the bed prepared with clean sheets if obtainable. If not, the bed is spread with clean newspapers. The accumulated litter is removed from the bed and room, also all unnecessary furniture, bedding, children, dogs, etc.

Provision is made for good light and also a supply of *clean* newspapers. These are used under the patient during delivery, over tables, chairs carrying the solution basins, and, in the absence of sheets, may be placed over the patient to protect her from the dirty comforters or blankets often supplied. If there is time the papers are sterilized by baking. Wrapped in paper after being dampened like clothes for ironing, they are baked like a loaf of bread.

The patient is delivered on the side, because this carries the pudenda well out of the bed, which is likely to sag deeply, or upon the kitchen table. The whole secret of doing aseptic obstetrics in a city hovel or country hut is to bear in mind that only the small cleansed area of the vulva is sterile, and everything else in the environment is infected. If

everything that comes in contact with the vagina and this small sterilized area is aseptic (*e. g.*, hands, sponges, instruments), the woman will not be infected.

When the child is born it is laid in a clean towel, and after the cord is cut the stump is dressed antiseptically. The babe is oiled, not bathed, and wiped dry with a clean towel. It is then placed safely near the stove.

The placenta is received in a scalded plate or a folded newspaper, the edge of which has been wet with bichlorid, or in a sterile basin if obtainable.

After delivery a clean newspaper covered with a towel is placed under the patient, or the bed is dressed with clean linen. A roller towel is applied for the binder.

Duties During the Puerperium.—The nurse visits the puerpera each morning, and spends one-half to one hour with her and the baby.

Duties at Each Visit.—The infant is to be dressed first. A full bath or inunction is given, the navel is dressed aseptically, and the rules given under sections on Care of Child carried out as fully as possible. Until the umbilicus is healed the child is not to have a full bath, because the bath-tub in such practice is anything but aseptic. Occasionally a tin dish-pan makes the best bath-tub for later use. The eyelids are cleansed with plain water, the diaper is changed, and the infant left in as comfortable a place as the house affords, away from drafty cracks or windows, secure from the attacks of flies, mosquitoes, vermin, and other household pests. The infants in this field of practice suffer much from bowel disorders, which are due to improper feeding, too frequent nursing, errors of diet of the mother, the administration of all sorts of teas, as saffron tea for jaundice, camomile, fennel tea, etc. Direct infection of the intestinal tract is encouraged by dirty bottles, nipples or fingers, flies, etc. The nurse should admonish and instruct the mother regarding these dangers and the manner of avoiding them, though her efforts may not have the desired success through the ignorance, not the unwillingness, of the people.

Infants under these circumstances suffer much from skin eruptions, which are due to insects, filth, coarse and cheaply dyed garments, impure soap or oil used for inunction, wrapping the babe too warmly, and the general unhygienic surroundings. Under such discouraging conditions it is remarkable and commendable that anything like success in treatment can be obtained, but an intelligent nurse interested in her work can really do wonders. The writer has seen evidences of this on many sides in his institutional practice.

The nurse each day takes the child's temperature and records it, with any unusual symptoms, on the record sheet.

After the infant has been attended to, the nurse gives the mother some care. A full bath every fourth day and daily washings of face, hands, and axillae are sufficient. The breasts are dressed, using normal saline solution and sterile pledgets, and the binder applied. The binder may be improvised out of a roller towel. The genitals are washed with 1 per cent lysol solution and a fresh pad adjusted. Another roller towel makes an abdominal binder. A clean night-dress and combing the hair complete the toilet.

It is unnecessary to say that when dressing the navel of the infant, the breasts, and the genitals of the mother the nurse should scrub her hands with green soap and water and sterilize them in lysol or bichlorid solution. If the visiting nurse must do other work besides obstetric, such as dressing ulcers, abscesses, attending pneumonia cases, the precautions she is required to take are much more rigorous. It would be better if the duties could be dissociated.

The obstetric work must be done first in the morning; the nurse should wash her hands with especial care before touching aseptic things and wounds (the navel, breasts, and genitals), and she should sterilize her hands each time after touching an infected case. The use of rubber gloves will spare the skin many of the discomforts caused by frequent sterilizations and corroding antiseptics. Rubber gloves find their greatest usefulness in district nursing.

After dressing the patient the bed is made as nicely as possible with the linen available, and the patient's temperature and pulse taken and recorded, together with such other items of interest as the nurse may discover. The nurse also records what services she rendered and the length of time of the visit. She secures sufficient ventilation in the lying-in room, if this is possible, and sees that the litter and accumulated rubbish are removed. She instructs the patient and the family as to the importance of cleanliness in these cases, and tries to obtain for the patient as comfortable



Fig. 245.—The visiting nurse's satchel and its contents.

and undisturbed a puerperium as the circumstances will permit.

If an enema is to be given, the nurse attends to this, or instructs some member of the family to do it. If there are sutures in the perineum, the nurse had better give it herself.

In order to do this work well, the articles needed should be taken by the nurse to the case. Figure 245 shows such an outfit, being the one used by the nurses of the Chicago Maternity Center and the Chicago Lying-in Hospital.¹

¹ The Chicago Maternity Center issues a booklet giving detailed and illustrated directions for carrying out its technic.

LIST OF ARTICLES IN POSTPARTUM VISITING BAG

One sterile brush and one tin box green soap.

One shaker with fine powdered soap.

Two pans for hand solutions.

One jar of cotton or gauze pledgets.

One jar of vulval and umbilical pads.

One towel for nurse's hands.

One apron.

One bottle of normal saline solution.

One bottle of sterile bobbin for retying cord if necessary.

One round flat bottle of bichlorid tablets labeled "Poison."

One square brown bottle of lysol labeled "Poison."

(All poisons are kept in differently shaped bottles and plainly labeled.)

Extra history sheets. Glass slides for "smears."

Visiting nursing is becoming more and more in demand by people in moderate circumstances; they are unable to employ a trained nurse, but, by having skilled service for the morning attentions, they manage to do very well the rest of the day with what help the family may render.

This is a very good plan from very many points of view. For the patient, it provides good scientific care; for the doctor, a security from uncleanly interference in his work, and it opens up a field of nursing to which those nurses who cannot stand the strain of continual service, night and day, may go. The plan is simple, the nurse going to the house in the morning and rendering such attentions as the case demands. Naturally, she will find more favorable surroundings and more things to work with than in the elcemosynary practice just referred to.

Prenatal care is one of the most important functions of the visiting nurse. In her daily rounds she has constant opportunity to spread its gospel. (See page 111.) She will either urge the women to report regularly at the clinics or she will conduct the routine examinations at the patients' homes.

HOSPITAL vs. HOME NURSING

One readily appreciates that hospital and home nursing are not identical, but they are in principle, though they differ much in practice. The methods described in this book apply equally as well to hospital as to home practice. The same diligent and consistent antisepsis must be practised in the home as in the hospital.

In early times it was safer for a woman to have her baby at home than in the hospital—indeed, public clamor nearly closed the maternities because of their high mortality. With the advent of antisepsis and asepsis, the reverse became true—the lying-in hospital was the safest place for a confinement. Now, statistics are showing that the general hospitals carry more danger to the parturient woman than she finds in her own home. Astonishing but true and that most sensitive of indicators the Life Insurance Tables seem to prove it.

Many circumstances must be invoked to explain this regrettable condition and something must be done about it right away. The author would suggest, among other remedies that apply directly to the doctors—the building of specialized maternity hospitals, architecturally and administratively separated from the general hospital, and, where this is not possible (a contingency which should not arise, and would not if the public were properly instructed)—the strictest isolation of the maternity ward from the rest of the general hospital and the most painstaking administrative methods for the prevention of contagion.

The methods of sterilization practised in hospitals and at home will be considered in the next chapter; here need be emphasized only the danger of carrying infection from one patient to another in hospitals.

Ward Care.—A large number of puerperae should not be put in one ward. The nurse should remember that even a healthy puerpera may infect the one in the next bed. This, of course, is especially likely if a puerpera is not well—has fever or fetid lochia. The nurse, therefore, between

dressings must sterilize her hands and provide fresh anti-septic solutions and pledgets.

Should any patient have an odor to the lochia, if the vulva becomes swollen, or little gray patches appear, and especially if the puerpera begins to be feverish, the nurse must immediately notify the head nurse on the floor, who will notify the physician. The nurse at once adopts extra precautions until the patient is ordered isolated. These are: Setting aside special basins, pitcher, and bed-pan for the use of the suspected case, and the wearing of rubber gloves when dressing her. These gloves are to be sterilized after each dressing. Pads from the vulva must not be touched by the fingers, but are to be handled with dressing forceps and burnt at once. Indeed, the entire dressing may be made by means of the forceps. It is convenient to throw all pads, etc., into large paper bags or wrap them in newspapers (see Fig. 191). The bed linen is soaked one hour in 3 per cent carbolic solution before being sent to the laundry. In this manner the spread of infection may be prevented. If, in hospital work, infection is carried from one patient to another, it is a lasting disgrace.

In the nursery the same diligent watchfulness is required to prevent infection of the eyes, mouth, navel, and intestinal canal from being carried from one baby to another. The nurse, therefore, looks for the first signs of ophthalmia, for the first spot of thrush on the tongue or gums, for the first irritation around the navel, for the first bleb of pemphigus, and for the first evidence of intestinal disorder in the bowel movements. If an infant presents evidences of a beginning conjunctivitis or any other infection, it must be isolated at once and the head nurse notified.

Dresses and linen from the infant are to be soaked an hour in a 3 per cent carbolic acid solution before being sent to the laundry; the nurse provides completely *separate utensils* for it, and does not touch any of the other children in the nursery before she has carefully disinfected her hands. As soon as the nature of the case is fully declared, the

physician will give instructions regarding the further treatment.

It is hardly less of a disgrace than carrying infection, if in a nursery ophthalmia is carried from one child to another, if thrush attacks the mouths of several babies, if a navel infection appears, or if an epidemic of intestinal disorders sickens a number of the children. Epidemics of thrush in lying-in hospitals are due to errors in sterilizing the nursing-bottles and nipples, letting several children use, without boiling, the same nipple, and carrying the infection from one mouth to another on the finger. These same causes obtain for intestinal infection. Epidemics of umbilical infection are very rare, and are always proof of grossest carelessness somewhere. An epidemic of pneumonia may start from a "cold in the head."

While there is danger of the communication of infection through the air, **contact, direct or indirect**, is responsible for the largest number of cases.

Recording of Symptoms.—The hospital nurse should remember to record and report to her senior every unusual symptom observed in either mother or babe. Now her duty is ended, and any oversight will not be laid at her door. All discharges from the patient or baby should be inspected, and anything unusual preserved for the doctor's inspection.

In general, the nurse should carefully and neatly chart the usual entries, as pulse, temperature, and respiration, and all unusual occurrences. After major operations the pulse and respiration are to be counted and recorded every fifteen minutes. The amounts of urine must be carefully recorded for at least two days, also the intake of liquids and food. Every evening the "Summary" at the bottom of the sheet should be filled out. A neat, accurate, and complete history sheet is an indication of a good nurse.

Prevention of Accidents.—Every year the author hears of an accident occurring in a hospital, such as burns with hot-water bottles, overdose of medicine, bichlorid poisoning from douches, etc. Ordinarily, physicians recommend

the hospital with considerable confidence, but the frequency of such accidents will do much to destroy this feeling.

Can they be prevented? Yes, in almost every case. Once in a while a combination of circumstances will occur that no human mind could foresee, but this is rare. Usually, some one has blundered, and, in the author's experience, carelessness, thoughtlessness, and a slipshod method of work are more often to blame than ignorance. While in an institution every one is expected to do his whole duty and do it well, and do it well all the time, the nurse cannot rely implicitly on everyone else, but must use her own judgment to see if those things concerning her and her work are done right. For example, if the night nurse makes carbolic solution and the day nurse sees pure acid floating at the bottom of the bottle, she will not use it for fear of burning the patient. If another nurse fills a hot-water bottle for her, she should herself test its heat before applying it to the patient.

Too much caution cannot be enjoined regarding the use of poisons. A nurse should not administer a poison unless she knows its nature, its physiologic action, and its dosage. Not knowing any one of the three, she should inform herself at the earliest moment. To avoid administering poison by mistake all bottles containing it should be of colored glass, or special poison bottles are to be used; they should be plainly labeled "poison," and the nurse should read the label once before and once after measuring off the required amount.

Orders.—A continued order is one that is kept up day after day. As such orders are often copied from one history sheet to another, or from one medicine slip to another, the nurse must be accurate in carrying them over. Should she notice an error, or what seems to be an error, in the copying, she should consult the head nurse before administering the dose. In hospitals continued orders are liable to be carried longer than really necessary, and in such cases the nurse is

justified in asking the physician if she should continue this or that medicine.

The nurse should not accept verbal orders, but should hand the history sheet or order book to the physician for his entry. If the order is given by telephone she should enter it "Verbal Order, Dr. X.," giving exact time.

When orders are given during operations, *e. g.*, for hypodermics or stimulants, the operator may wish to know that they have been executed. The nurse then announces, so that he may hear, the fact that "the morphin has been given," etc.

Relations to the Patient.—Most people dread even the word hospital, and this dread is not unfounded. If the word "hospital" could be made identical in meaning with the word "home," this dread would vanish. It is the hospital nurse's duty to make each patient feel as if she were in her own home. It is pleasantly surprising how much can be done in this direction if only the will is there. An obstetric case is more than a medical case, and, in addition to aseptic and skilful nursing, the expectant mother requires womanly sympathy. She must not be treated as "material." A hospital can be decorated and furnished very much like a home without straining the requirements of asepsis; if hospital authorities would appreciate this fact, the modern movement in favor of hospitals for the sick would receive remarkable impetus. But, finally, it is the nurse—the personality of the nurse—that makes the atmosphere around the institution, just as it is the spirit of the hostess that breathes in every object about the home.

Economy.—The hospital nurse—and the hospital doctor—must often be accused of wastefulness. Most hospitals are supported either wholly or in part by money contributed by the charitably inclined. It often requires the most strenuous efforts of a large board of managers to raise funds sufficient to meet current expenses and to provide the improvements needed. The public has a right to

demand that hospital authorities expend the money intrusted to them in the most economical manner, so that the largest number may receive the benefit. Wilfully or thoughtlessly to increase the cost of conducting an institution is to limit the institution's power of doing good, and some one will suffer. Further, some one will have to give the money to make up the loss caused by wastefulness. Wilful wastefulness is, therefore, very close to stealing.

The nurse who is extravagant with linen throws unnecessary work on the laundry. If foods are allowed to spoil, the culinary department shows a needless deficit. If gauzes, sponges, and dressings are wasted, the medical supply bills become too large. All these drains together make a burden which might prove too much for the institution. "Little wastes in great establishments, constantly occurring, may defeat the energies of a mighty capital" (Lyman Beecher).

PELVIC MENSURATION

It is important for the accoucheur to know if the pelvic canal of the prospective mother is large enough for the passage of the baby. The science of pelvimetry, pelvic measuring, will give him the necessary information. The subject is far too complicated and extensive for full presentation in a nurses' text-book, but since nurses are occasionally required to measure the pelvis, the routine methods will be briefly described. The only scientifically correct results are those obtained by direct internal measurement, but the outward contour of the pelvis when carefully studied gives information which enables us to judge, approximately, of the size and shape of the bony canal. There are four external and four internal dimensions which the physician wishes to have taken:

External.—1. The distance between the spines of the ilia, abbreviated, **Sp. I.**, Normal—**26 cm.**

2. The distance between the crests of the ilia; **Cr. I.** Normal—**29 cm.**

3. The distance between the great trochanters; **Bi T.** Normal—**31 cm.**

4. The anterior posterior diameter, from the depression under the last lumbar spine to the anterior surface of the pubis, called the external conjugate or Baudelocque's diameter, **D. B.** Normal—**20 cm.**

Internal.—1. The conjugata vera, **C. V.**, or true conjugate, which is the anterior posterior diameter of the inlet of the pelvis, cannot be measured directly (except from above with the abdomen open).

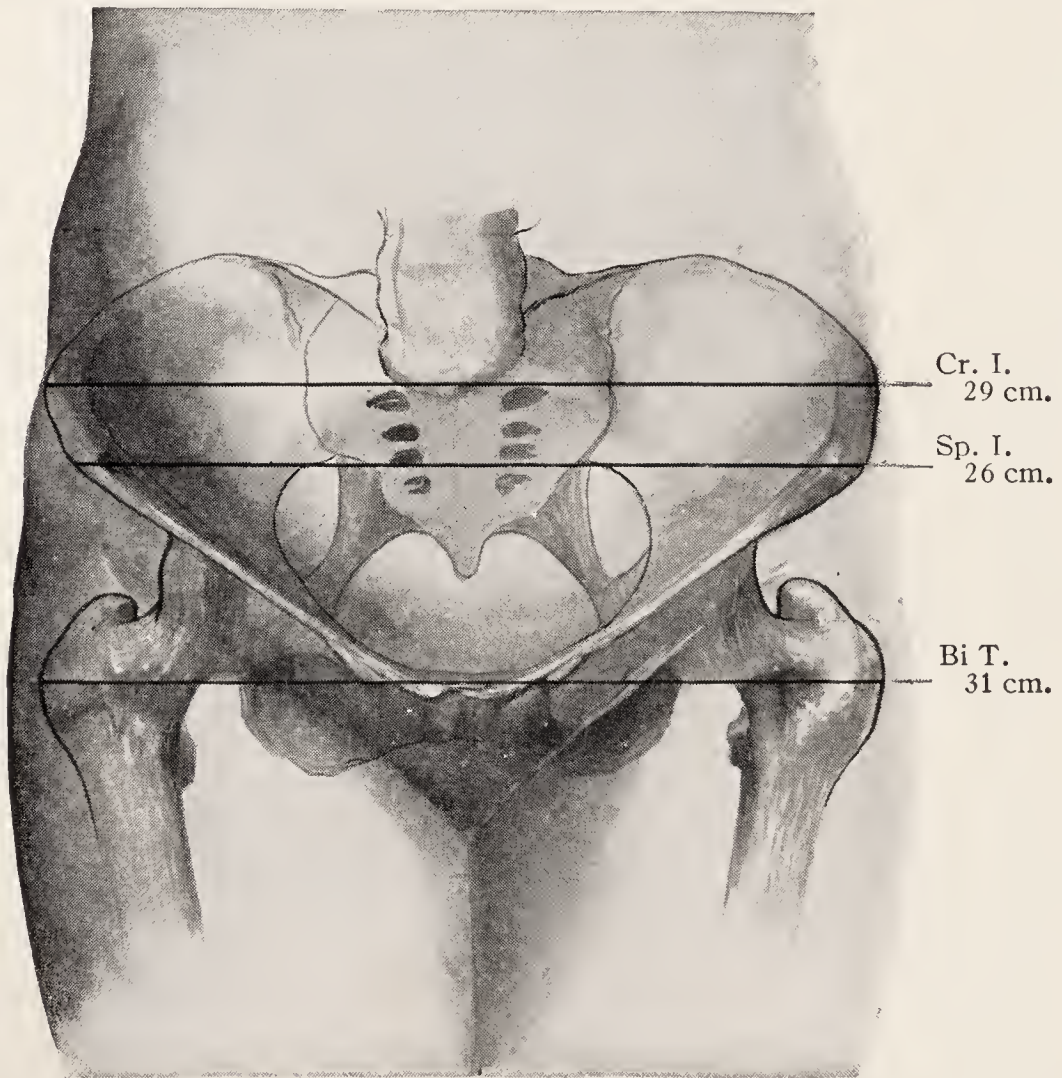


Fig. 246.—The three side-to-side external measurements showing where to place the pelvimeter.

Therefore we take the diagonal conjugate, or **C. D.**, the distance from the under edge of the pubis to the promontory of the sacrum. Normal—**12½ cm.** To obtain the length of the **C. V.** we deduct 1½ to 2½ cm., depending on the kind of pelvis before us. The normal **C. V.** is **11 cm.**

2. The distance between the spines of the ischia, giving us the breadth of the pelvic canal, **Bi Sp.** Normal—**11 cm.**

3. The distance between the tuberosities of the ischia, **Bi Isch.** Normal—**11 cm.**, which is the breadth of the outlet.

4. The distance between the lower edge of the pubis to the end of the sacrum. Sacropubic, S. P. Normal— $11\frac{1}{2}$ cm., which is the length of the outlet.

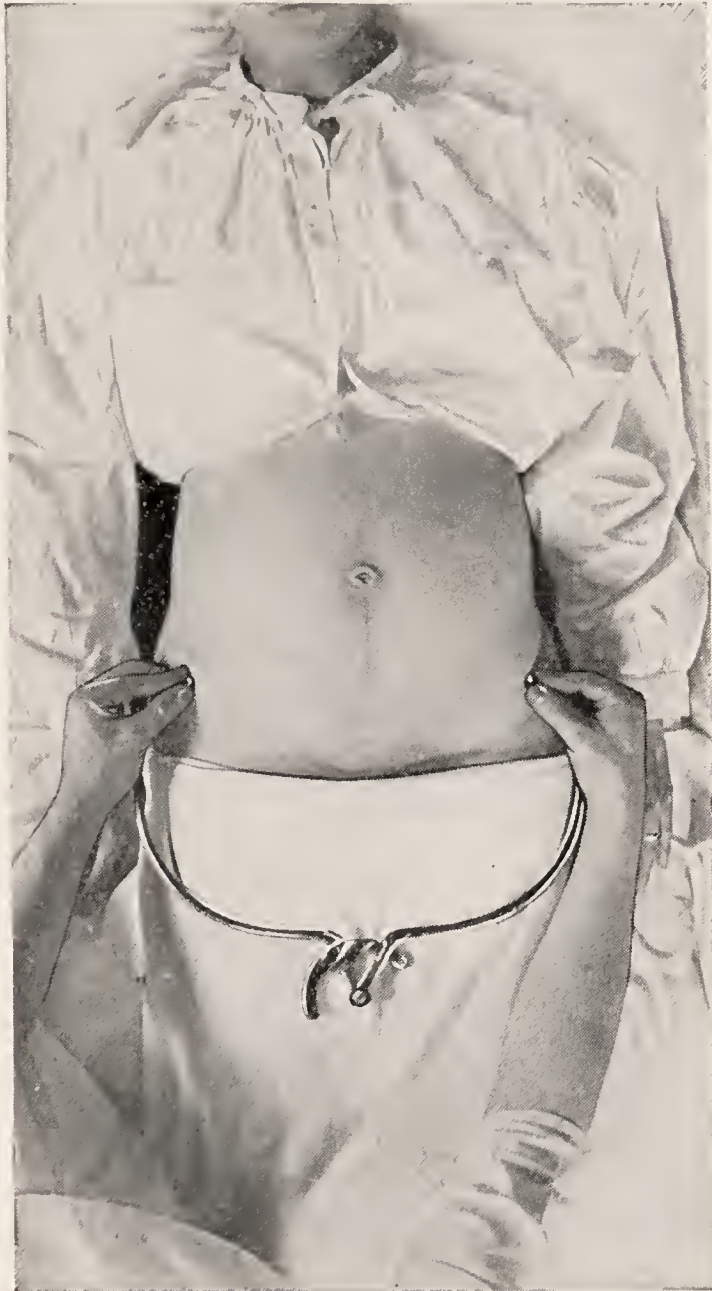


Fig. 247.—Taking the interspinous diameter (Sp. I.). With the knob of the pelvimeter between the thumb and index-finger, the outer lip of the spine is sought on each side, pressing in until the bone is reached. The crests (outer lips) and trochanters are measured similarly. The patient may stand or lie flat on the back with knees close together.

Figures 246 to 252 teach the nurse how to take these various measurements, but how can she interpret them? First, let her place the figures obtained opposite the normal values and compare them, then a few general rules may be applied.

<i>Case of Mrs. A.</i>			<i>Normal. Mrs. A.'s pelvis.</i>	
<i>External</i> —	Between iliac spines,	Sp. I. —23	26	—3
	Between iliac crests,	Cr. I. —25	29	—4
	Between trochanters,	Bi T. —27	31	—4
	Baudelocque's diameter,	D. B. —18	20	—2
<i>Internal</i> —	Conjugata diagonalis,	C. D. —10½	12½	—2
	Estimated conj. vera,	C. V. —9	11	—2
	Between spines,	Bi Sp. —9	11	—2
	Between tuberosities,	Bi Isch —8	11	—2
	Pubis to sacrum,	S. P. —9	11½	—2



Fig. 248.—This lozenge-shaped space marked by four dimples and which the Greek sculptor shows so clearly in his Venus de Milo, is called the rhomboid of Michaelis. The upper dimple is the one from which the external conjugate is measured. The beautiful rhomboid is distorted when the woman has a contracted pelvis. It becomes squat with a flat pelvis and irregular if the woman is asymmetrically built.

The nurse will readily note that in the case of Mrs. A. all the dimensions are smaller than normal. Mrs. A., therefore, has a generally contracted or justominor pelvis (see Fig. 11, page 31), and if



Fig. 249.—Taking the external conjugate or Baudelocque's diameter, D. B. One knob of the pelvimeter is fitted into the dimple below the last lumbar spine and the other rests on the pubic bone near the top. The instrument has to be pressed in firmly which hurts a little sometimes. Best taken with patient standing.

the baby is normal in size or larger than normal she will have a difficult labor. If the baby is a very small one it may go through the canal safely.

*Case of Mrs. B.**Normal. Mrs. B.'s
pelvis.*

<i>External</i> —Between iliac spines,	Sp. I.	—28	26	+2
Between iliac crests,	Cr. I.	—29	29	0
Between trochanters,	Bi T.	—34	31	+3
Baudelocque's diameter,	D. B.	—17	20	—3
<i>Internal</i> —Conjugata diagonalis,	C. D.	—10	12½	—2½
Estimated conj. vera,	C. V.	— 8	11	—3
Between ischial spines,	Bi Sp.	—12	11	+1
Between tuberosities,	Bi Isch.	—12	11	+1
Sacrum to pubis,	S. P.	—10	11½	—1½

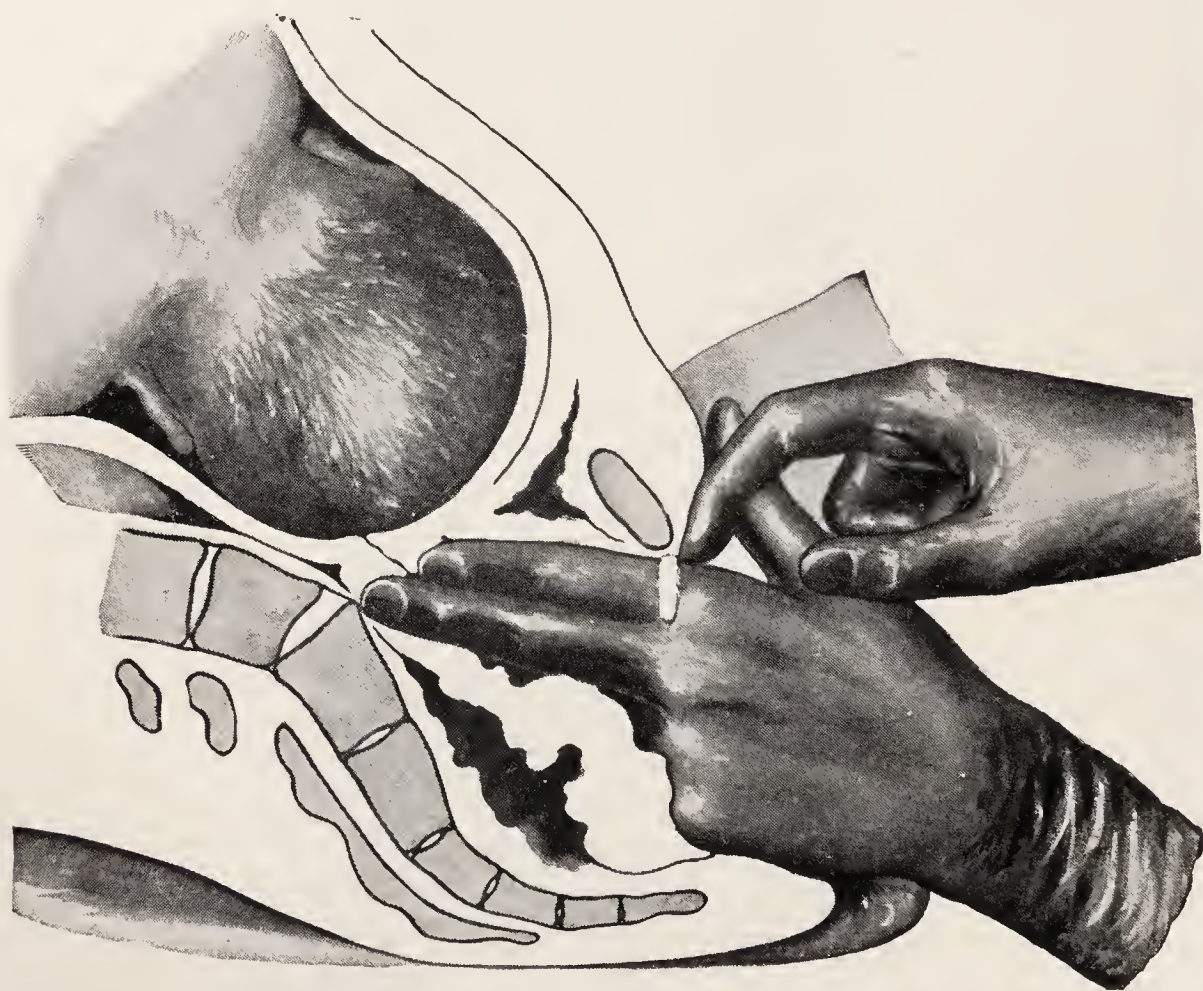


Fig. 250.—Taking the conjugata diagonalis, C. D. Two fingers are passed upward into the vagina and with gentle pressure seek the promontory of the sacrum. While the base of the index-finger rests against the under edge of the pubis, one finger of the other hand insinuates a tiny roll of cotton up to the edge of the bone. When the fingers are removed—without disturbing the cotton mark, the distance from the tip of the middle finger to the mark is measured with the usual pelvimeter. To obtain the true conjugate—the shortest diameter between the promontory of the sacrum and the pubis—deduct 1½ to 2 cm.

Mrs. B.'s dimensions show a marked contrast. All the anterior-posterior diameters are shorter than normal, while those from side to side are normal or larger than normal. Mrs. B. has a flat pelvis (see Fig. 10, page 31). The contraction is between the promontory of the sacrum and the pubis, and if we deduct 2 cm. from the conjugata



Fig. 251.—Taking the sacropubic diameter. One knob of the pelvimeter rests over the end of the sacrum (not the coccyx) and the other just at the under edge of the pubis, near the clitoris. Be gentle, as this measuring process hurts. Deduct $1\frac{1}{2}$ cm. from the result obtained to get the actual distance, S. P.

diagonalis to get the true conjugate we will have a C. V. of 8 cm. A full-term baby seldom will go through such a narrow passage, as the bitemporal diameter of the child's head normally is $8\frac{1}{2}$ to $9\frac{1}{2}$, but, since there is room at the sides of the pelvis, the broad portion of the head may slip off the promontory of the sacrum and thus allow a smaller diameter to pass through the C. V.

<i>Case of Mrs. C.</i>		<i>Normal. Mrs. C.'s pelvis.</i>		
<i>External</i> —	Between spines,	Sp. I.	—26½	26 + ½
	Between crests,	Cr. I.	—29½	29 + ½
	Between trochanters,	Bi T.	—34	31 +3
	Baudelocque's diameter,	D. B.	—21	20 +1
<i>Internal</i> —	Conjugata diagonalis,	C. D.	—12½	12½ 0
	Between spines,	Bi Sp.	—10	11 —1
	Between tuberosities,	Bi Isch.	— 7	11 —4
	Pubis to sacrum,	S. P.	— 9	11½ —2½

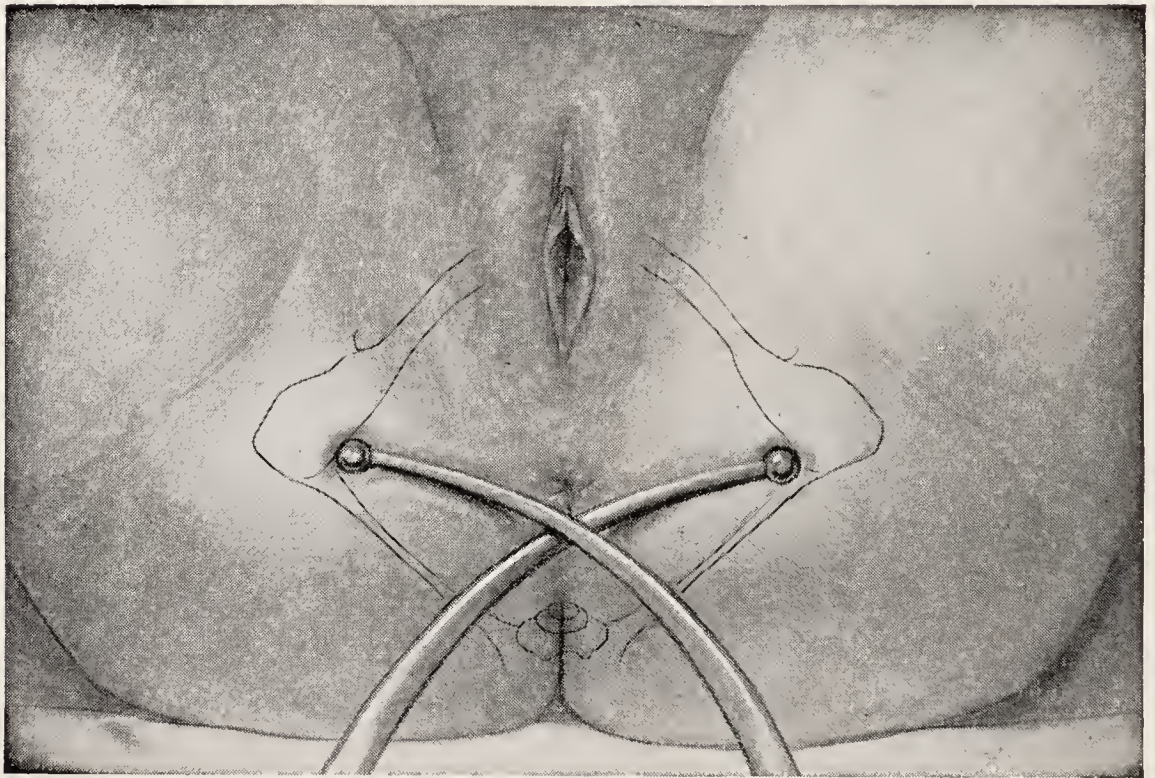


Fig. 252.—Taking the distance between the tuberosities. The blades of the pelvimeter are crossed, and then the knobs, after being laid between the large bones, are separated. When the resistance brings them to a full stop the scale is read. Another way, perhaps a better one, is to cut an ordinary flat wooden tongue depressor until it just fits in between the two bones and measure it.

Mrs. C., from her external measurements, has a large well-shaped pelvis, but note the outlet. There we find a reduction in all the dimensions. Mrs. C. has a funnel or masculine type pelvis, large and roomy at the top, narrow at the bottom. The baby's head will not meet obstruction until it reaches the spines and has to pass from between the tuberosities of the ischia. In her case the baby would have to be very small, its head soft and moldable, and the pains strong to overcome this obstruction.

Case of Mrs. D.

*Normal. Mrs. D.'s
pelvis.*

<i>External</i> —Between spines,	Sp. I.	—22	26	—4
Between crests,	Cr. I.	—24	29	—5
Between trochanters,	Bi T.	—27	31	—4
Baudelocque's diameter,	D. B.	—17	20	—3
<i>Internal</i> —Conjugata diagonalis,	C. D.	— 9	12½	—3½
Between spines,	Bi Sp.	— 9	11	—2
Between tuberosities,	Bi Isch.	— 8	11	—3
Pubis to sacrum,	S. P.	— 9	11½	—2½

Mrs. D. has a type of pelvis very rare in America. It is both generally contracted and flat. Note the **C. D.**—it is only 9 cm. If we deduct 2 cm. to obtain the **C. V.** we find that the anterior posterior distance of the inlet is only 7 cm., and further, there is no room at the sides of the pelvis into which a soft pliable head could be molded. Mrs. D. should have an elective cesarean section.

Nature is able to accomplish a great deal in contracted pelves, and most accoucheurs give such patients a "test of labor." This is to see what the natural powers can do. The uterine contractions compress the head in one portion and let it expand in the other directions, thus adapting it in the best possible manner to the distorted canal through which it must pass. We call this function "molding." If the head is too hard to be molded or the disproportion between the baby's size and the available room in the pelvis too great, labor comes to a standstill, and unless art steps in to aid—both mother and baby will die.

We have here another demonstration of the importance of prenatal care. We can discover beforehand the dimensions of the pelvis and the size of the child. If a natural birth seems impossible we can induce labor while the child is very small, or wait until term and do a cesarean section, either before the pains begin or after a short test of labor—in both cases at a time when the abdominal delivery is most safe. On the other hand, if a woman with a contracted pelvis is ignorantly allowed to go into labor, the favorable time for cesarean section may slip by or the baby die from forceful attempts at delivery.

METHODS OF STERILIZATION

Obstetric asepsis is equally as minute as surgical, and, if the best results possible to modern science are to be obtained, is equally cumbersome. There is one fundamen-

tal difference in the technics of the two arts—the fact that the obstetrician is always working in or near an infected field. The vagina is seldom really sterile, and the rectum is so close to the field of operation that it is a constant menace. The accoucheur, therefore, cannot practice, during a labor, the nice aseptic methods of the surgeon; he must practice antiseptics. As far as dressings, sutures, etc., are concerned, the accoucheur insists on their being absolutely aseptic, as does the surgeon.

The fact that the obstetric case cannot be handled as a clean surgical case does not excuse either doctor or nurse from responsibility if the patient sickens from infection. If both doctor and nurse have conscientiously and consistently carried out the best methods of antiseptics known, and even then the patient takes ill of infection, both may feel that they are blameless in this regard—but only under the condition mentioned.

Sterilization of the Hands.—Scientifically, it is impossible to sterilize the hands. Germs may be found in the skin after all sterilizations as usually performed. Practically, it has been found that several methods give good results.

The most important factor in being able to sterilize the hands is *not to get them infected*. The day has passed when a physician could dabble his fingers in pus and then feel clean after washing them.

NEVER GET ANY INFECTIOUS MATERIAL OF ANY KIND ON THE HANDS! All such things should be handled with forceps or rubber gloves, and also they should not be allowed to contaminate the clothing.

Take good care of the skin, so that the epidermis is always smooth and free from cracks and fissures. The arts of the manicure may not be despised. It is not vanity that prompts the obstetric nurse to desire smooth, white hands.

1. Fürbringer's Method.—Pare finger-nails and remove subungual dirt with a dull instrument. Scrub for from five to ten minutes with hot water and green soap. Soak hands

in 70 per cent alcohol for one minute. Soak in 1 : 1000 bichlorid three minutes.

Mercuric iodid is now sometimes used instead of bichlorid in the strength of 1 : 4000 or 5000.

2. Hot Water and Alcohol Method of Ahlfeld.—Pare finger-nails and remove subungual dirt. Scrub with soap and hot water for from three to five minutes; 70 per cent alcohol rubbed in three to five minutes with flannel, which wraps the hand until ready to operate. Ahlfeld claims that this method will perfectly sterilize the skin.

3. Usual Method.—Wash the street-dirt from hands and forearms, using much soap and working the soap well under the nails, which should be short. Clean under the nails with a dull metal nail-cleaner. Scrub in hot running water and green soap for ten minutes. Scrub in 1 per cent lysol, or 1 : 1000 bichlorid, or both, two full minutes. Scrub in 70 per cent alcohol one minute.

When scrubbing the skin a sterile brush made of tampico fiber should be used. These brushes may be boiled; bristle brushes stand boiling poorly. The folds of the fingers and palms must be opened up so that the fibers of the brush can get into them. To get the fibers of the brush under the nails the fingers must be stretched out. This draws the finger-tip from the nail. If the finger-tips are pressed together, the brush cannot get under the nail. The whole hand and forearm must be gone over systematically, so that no portion is missed.

N. B.—After the hands are sterilized, it requires constant thoughtfulness to prevent one from infecting them by touching unsterile objects.

Rubber Gloves.—These are by all means the best method of aseptic operating, but the gloves must be perfect and sterile. Before putting on gloves the hands are to be sterilized in the usual manner.

Methods of Sterilizing Gloves.—(1) Boiling in plain water for twenty minutes and putting on, wet with some anti-

septic solution. (2) Boiling in water for twenty minutes; drying by sterile hands; powdering with sterile talcum or starch, inside and out; wrapping in sterile towels for future use.

Whenever the nurse boils gloves or rubber of any kind, as colpeurynters or douche-bags, she should wrap them

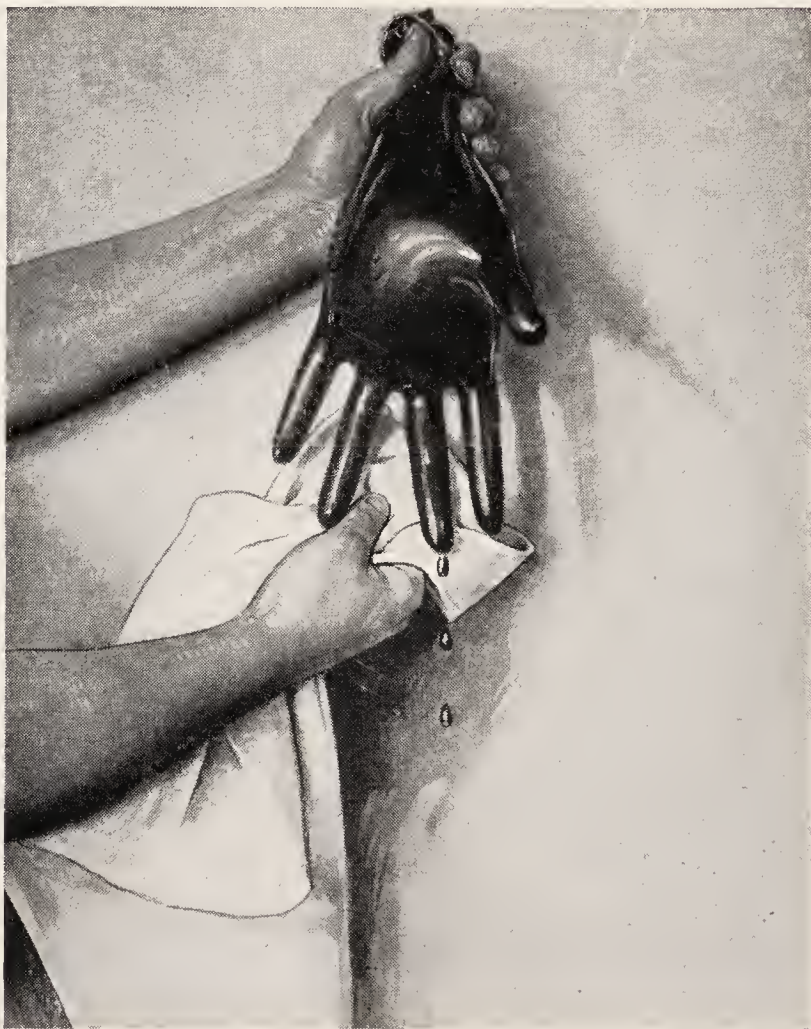


Fig. 253.—Testing rubber gloves by overfilling with very hot water.

securely in at least four layers of thick toweling; otherwise they will be scorched and ruined by lying against the hot metal, or they may not be covered by the boiling water and, therefore, will not be sterilized. Rubber gloves do not stand frequent boiling, becoming swelled and brittle.

Author's Method of Sterilizing Rubber Gloves.—The gloves are washed and tested for imperfections by filling them up with very hot water and drying the outside (Fig. 253).

If the water escapes, even in the smallest amount, the glove is discarded or patched.

The gloves are always washed with soap and water and lysol solution, and then boiled for three full minutes in plain water. The nurse prepares herself as for operation (sterile gloved hands, sterile gown, head-piece, and mouth cover), dries the boiled gloves carefully with a sterile towel, powders them evenly on both sides with sterile talcum, mates each pair, labeling right and left, packing them, with the cuffs turned down, together with a little bag or envelope of sterile talcum powder, into special glove containers, also previously sterilized. They are given the proper labeling tags, laid in metal boxes or wrapped, and then, having been placed in the center of the steam chamber, are subjected to a second sterilizing in the autoclave—flowing steam to assure saturation, exposure at 15 pounds' pressure for ten minutes, drying for ten minutes. Dry steam at 240 F. destroys rubber rapidly, and gloves seldom stand more than three sterilizations of ten minutes each.

If only a low-pressure steam sterilizer is available the technic is the same—with a few extra precautions. Each glove is to be partly filled with cotton to admit steam to its interior and is separately wrapped. The glove packages should be placed in the center of the steam chamber as far from the flame as possible. The steam should be allowed to flow briskly around the gloves for a full hour. The packages are removed with sterile hands, wrapped in sterile towels, and laid over a radiator to dry. The absolute sterility of rubber gloves is of such vital importance to the patient that the nurse cannot be urged sufficiently to use the most extreme care to insure it.

In putting on sterile gloves the nurse should never touch the outside of the glove with her bare hand. It is impossible to disinfect the skin.

Sterilizers.—For practical sterilization it is not necessary to have the majestic and expensive sterilizers used by most

hospitals. Moist steam under moderate pressure will kill all the usual germs in forty minutes. If the steam is very dry, as occurs in high-pressure sterilizers or autoclaves, the germs are not so readily killed. Low-pressure sterilizers, as the Arnold, the Rochester, or the Boeckman, all of which are built on the Schimmelbush plan, are very efficient because the steam is wet, and experiment and experience have shown that very reliable results are obtained with these instruments if they are properly managed. The obstetric nurse practising in sparsely settled districts should possess a small portable sterilizer which she can send to the houses of her patients.

In the absence of special apparatus the wash-boiler and the stove-oven render inestimable service. The objection to the wash-boiler is that the cottons, gauzes, linens, etc., steamed therein become quite damp or even moist. This objection may be overcome by drying the articles afterward in the oven of the kitchen stove, taking care they are not burned. The sheets, towels, etc., to be sterilized are loosely wrapped in cloth containers and tied to the cover of the boiler so that they hang suspended hammock-like over the boiling water. A vigorous boiling over a hot fire for one hour will give satisfactory results.

Sterilization by Dry Heat.—The oven of the stove may be used for sterilizing all supplies save rubber and suture material. The oven should be heated to the temperature required to bake bread, and articles to be sterilized are kept in it for three hours. Newspapers should be wrapped around them, and the required heat is shown by the light browning of the paper. Great care is necessary to prevent scorching of linen and gauze. The writer has only occasionally made use of this method of sterilization.

Sterilization by means of antiseptic solutions is rarely employed for dressings, gauzes, linens, etc. For tables, beds, walls, etc., scrubbing with soap and water and then

with an antiseptic solution is usually deemed sufficient, because sterile things are not allowed to touch them

PREPARATION OF INSTRUMENTS

Obstetric instruments should be boiled in 1 per cent soda or 1 per cent borax solution. If no washing- or baking-soda is at hand, a little lysol or sodium hydrate will do. An alkali is necessary, because it prevents the instruments from rusting and secures better sterilization. Boiling for twenty minutes in such a soda solution with the vessel tightly covered is sufficient, but if the instruments have possibly been infected, two such boilings or a forty-minute period are better. If instruments are to be kept aseptic for a time before being used, the soda solution should not be poured off or the cover removed. Soft-rubber goods are scrubbed well with soap and water, washed thoroughly with strong lysol solution, wrapped in at least four layers of a thick towel, and boiled twenty minutes in plain water in a covered vessel. Hard-rubber instruments and tracheal catheters must not be boiled. They are disinfected by formaldehyd vapor or by immersion in strong bichlorid solution after being scrubbed well with soap and water. Cystoscopes (except the simple tubes) are washed with soap and water and disinfected by formaldehyd vapor or by lysol or carbolic solutions, not bichlorid. They must not be boiled.

After being used instruments are scrubbed with a brush and cold water, paying particular attention to the locks, corrugations, and crevices; then they are rinsed in a hot 1 per cent lysol solution and dried out of the latter. Stains on the instruments are removed by scrubbing with Hand Sapolio on a moist cloth. After use on septic cases the instruments should be boiled before being put away. Imperfections in the instruments and loss of nickel-plating are to be reported to the proper authority. If a nurse finds an instrument whose construction she does not understand,

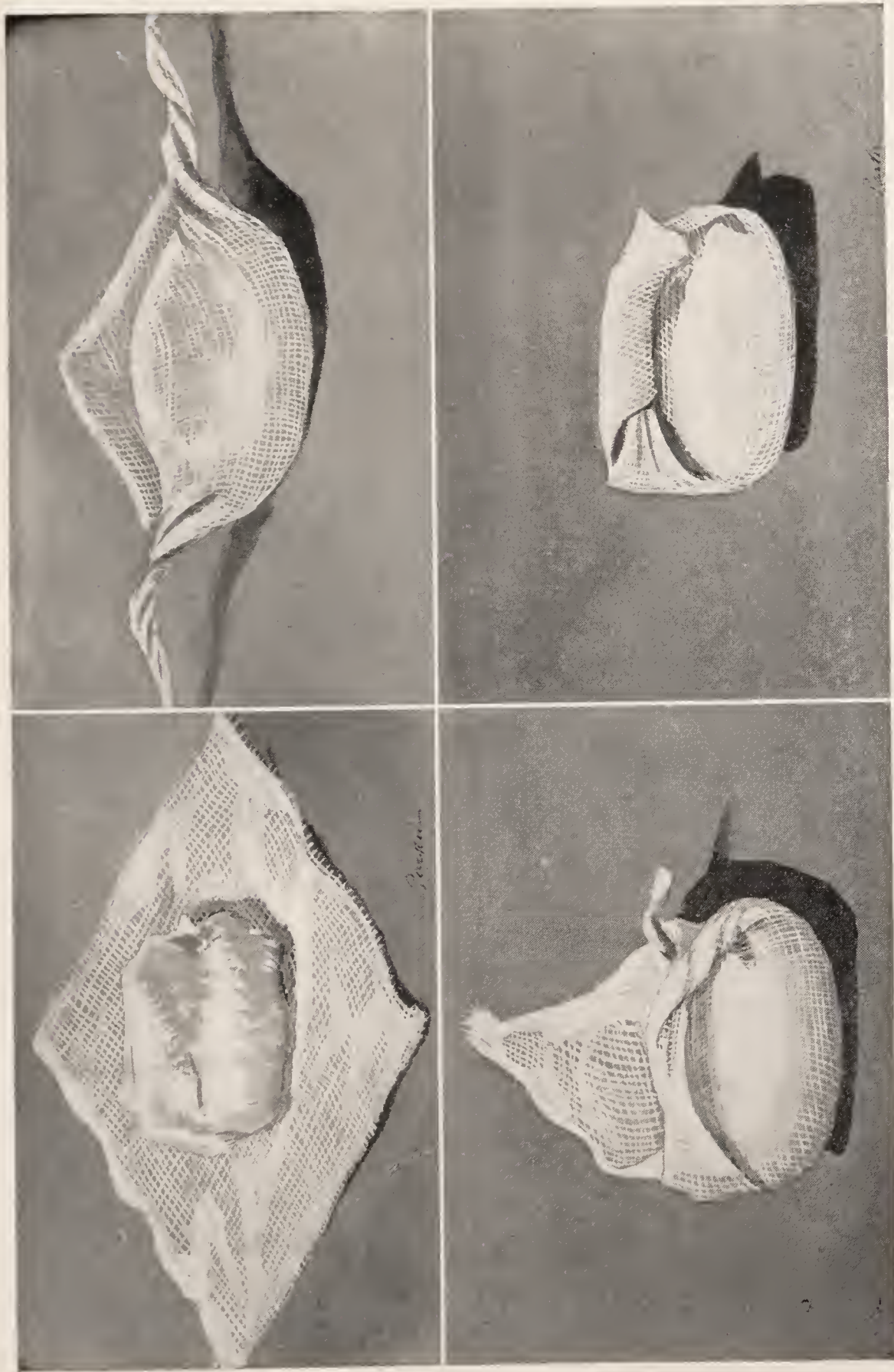
it would be well to learn about it before taking it apart or trying to put it together, as she may do it damage.

STERILIZATION OF BRUSHES

After use on a septic case brushes are destroyed. Old brushes with very soft fibers are discarded, yet a brush must not be so stiff that it scratches the epidermis. Such scratches become lodging places for germs. Brushes are thoroughly washed with soap and water, rinsed, and then steamed in the sterilizer for forty-five minutes. They are best kept dry, wrapped in cloth or paper containers. A brush once used is not used again by another, or for a more advanced period of the hand sterilization. Brushes should not be allowed to litter up the washstand; this is neither aseptic nor tidy. Two jars for brushes should be at hand—one filled with sterile, the other for the used, brushes. Many errors of asepsis are committed in the use and care of hand-brushes in an otherwise flawless system.

PREPARATION OF DRESSINGS

Cotton coming in unsealed cartons is not sterile. For use as sponges or pledgets, pieces of suitable size are made from the roll and sterilized in a double pillow-case or in glass jars. The latter is better. Cotton pledgets are better large than small. Gauze pledgets, as used in surgical work, would be very expensive in obstetrics practised at home, as so many are used, and they must be quite large. Cotton answers the purpose well, but if gauze is preferred, the nurse may make a pledget of cotton, covering it with one layer of gauze. These are called "covered sponges," and have all the advantage of gauze with the cheapness of cotton (Figs. 254–257). These covered sponges are packed into jars, covered with a layer of cotton, and sterilized one hour in flowing steam. The jars are very loosely covered during sterilization; after it, the covers are screwed down tightly. In maternity practice, where the delivery is con-



Figs. 254-257.—Making the covered cotton sponges. The opposite corners of the gauze are twisted and tied over the third corner, after which the fourth corner covers in the free ends, so that no threads of cotton appear.

ducted exactly like any other surgical operation, gauze sponges are used—those of the Mayo type being very

practical. These are of surgical gauze cut 9×36 inches, with the loose threads drawn out. They are sterilized in packages of six.

Pads or vulvar dressings are made by folding a piece of absorbent cotton 3 by 8 inches into a piece of gauze 12 inches square, leaving the ends long. They are wrapped in towels or cotton-cloth sacks, and sterilized in flowing steam for one hour, dried in the sterilizer, and laid away in a dust-proof box.

Turkish Pads.—A small bath towel folded double, with the edges hemmed, makes a convenient pad to keep under the buttocks during delivery. It absorbs the blood, liquor amnii, etc., which might otherwise soil the bed. The nurse should sterilize six.

Newspapers.—One of the handiest articles in the lying-in room is the clean newspaper. The newspaper fresh from the press is practically clean, and is very useful to receive discharges, soiled pledgets, pads, etc., which are thereupon wrapped up and burned. The nurse should, if the opportunity is given, sterilize, as she would a package of towels, a bundle of clean newspapers.

Cellophane is a very handy, cheap, sterilizable, impervious protector for beds, tables, wounds, etc.

Lysol Gauze for Tamponade.—Three widths of gauze are required in packing the uterus, depending on the time of pregnancy. For use in the early months a strip about 4 inches wide is best, the gauze being cut into 5-yard lengths, and loose threads carefully removed from the edges. In the middle of pregnancy gauze 8 inches wide is used. Woven bandages are purchasable and are preferable to cut gauze. Glass tubes are the best containers (Fig. 259). For packing the uterus at or near full term these narrow strips would be useless.

Here the gauze is cut $\frac{1}{2}$ -yard wide, into lengths of 12 yards. The selvedge and cut edge are folded in, and each length is made into a bundle. The bundles are then thoroughly rinsed in running water, wrung dry by hand,

and boiled for twenty minutes in 0.5 per cent lysol solution. A pair of rubber gloves and 3 sheets are now sterilized by steam or boiling. Wearing the gloves and having covered the table with the sheets the nurse wrings the bundles dry using considerable pressure. Then the strips are packed into sterilized Mason jars or others that are large enough, packing smoothly in circles from below upward (Fig. 260). Thus the tamponade can be made directly from the jar. The gauze must not be rolled and then placed in ars. The tops of the jars are filled with layers of cotton,



Fig. 258.—Frame for stretching gauze sponges. Size, 9 x 36 inches.

the lids are screwed down tight, and the jars are put in the sterilizer. They are sterilized on two successive days, two hours each time. The jars are then wrapped in three layers of paper, sterilized again, and put away in a clean place. Thus prepared, gauze will keep sterile for years.

Plain sterilized gauze is prepared by cutting the gauze, as it comes from surgical supply-houses, into the requisite lengths, as just given, packing into the jars as described, and sterilizing in the steam-chamber every day for three days, two hours each time or once under high pressure.

High-pressure sterilizers if overheated will scorch the gauze, rendering it brittle. A piece of such gauze may break off and be inadvertently left in the wound. Gauze

coming from surgical supply-houses should not be trusted unless it is in hermetically sealed containers.



Fig. 259.—Gauze of different widths to fit several sizes of uterine tubular packers. Note the tubes are plugged with a covered cotton sponge, over this another cover. They are wrapped in two layers of paper.

Iodoform gauze is very seldom used in obstetric practice, and the various methods of preparation need not be detailed here.

Other drugs are used in preparing gauze, as chinosol, vioform, boric acid, bichlorid, thymol; non-absorbent



Fig. 260.—Gauze for uterine tamponade. Shows the method of packing into the jar in layers from the bottom.

gauze is also sometimes used instead of the absorbent. From extensive experience the author can recommend the lysol gauze as prepared in the manner described.

Gelatin Gauze.—Gelatin favors coagulation of the blood, and is sometimes used to impregnate gauze introduced into the uterus for the control of postpartum hemorrhage. In emergency 2 ounces of pure French gelatin are dissolved in 20 ounces of boiling water and the mixture boiled vigorously over a very hot fire with constant stirring for at least twenty minutes. The solution is poured over the gauze just before its introduction.

The “Kite-tail” Tampon.—For packing the vagina with dry cotton one may prefer the “kite-tail” tampon illustrated in Fig. 261. The pledgets of cotton are securely tied as shown in a long string and packed into jars. The vagina is filled with them in the usual manner. The string facilitates their removal.

Suture Material.—In obstetric work, without doubt, silkworm-gut is the best material for suture.

Method of Preparation.—It should be washed with tincture of green soap and water, wound in little rings containing three strands each, boiled in plain water for thirty minutes, and placed with sterile forceps in sterile glass bottles containing 1:1000 bichlorid. The tops of the bottles are covered with cotton, and in this way the gut will keep sterile for months. Some operators, and especially those in private practice, prefer to boil the gut just before the operation or with the instruments. The nurse should see that it is thoroughly washed with soap and water first.

Catgut.—Many hospitals and most doctors in private practice buy catgut already prepared. It comes in sealed paper envelopes or in glass tubes or bottles. The sterilization of catgut is a difficult matter, and there are many methods; for example: (1) Boiling in cumol; (2) boiling in alcohol under pressure; (3) boiling in saturated solution of ammonium sulphate; (4) soaking in ether, bichlorid, alcohol, and juniper oil; (5) soaking in iodine solutions, (6) iodoform solutions, etc. The writer hardly thinks it

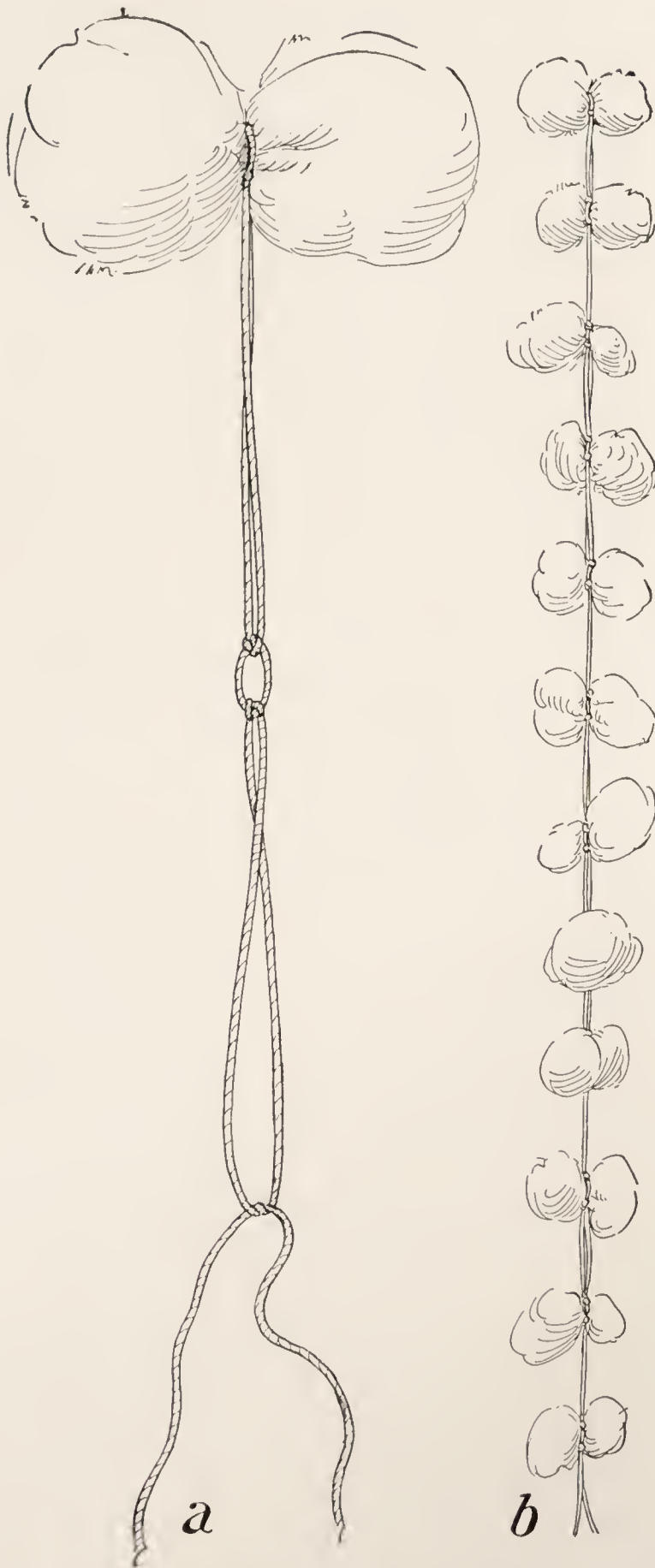


Fig. 261.—The "kite-tail" tampon.

necessary to describe all these methods, and refers the nurse to surgical text-books for the details.

Silk.—This is not much used in obstetric practice. It is best prepared by thorough washing in hot water with tincture of green soap, boiling in 1 per cent lysol solution for thirty minutes, and rinsing thoroughly in sterile water just before use. Some physicians sterilize it in the steam sterilizer with the dressings. The preliminary washing with soap and water is not to be neglected. Silk should not be wound on glass with sharp corners. If sterilized and kept, it deteriorates after a time, no matter what solution is used as a preservative.

Waxed Silk.—Surgeon's twisted black silk; No. 5 for appendix, in 1-yard lengths; No. 9 for skin, in $2\frac{1}{2}$ -yard lengths; No. 12 for ligating tubes, etc., in 1-yard lengths.

Pieces of cardboard, $1\frac{1}{2} \times 2\frac{1}{2}$ inches.

Coin envelopes, $2\frac{1}{2} \times 3\frac{1}{2}$ inches.

Wax paper in 5 x 5 inch pieces.

One large piece of wax paper, 15 x 18 inches.

One 6-inch artery forceps.

Parawax in covered jar.

Container for finished silk.

Wash silk with soap and water. Wrap proper lengths on cardboards and hold ends with notch. Place all articles on a tray covered with a towel, arranging the envelopes in a long row with flaps up to avoid sticking. Sterilize by steam under pressure, 20 pounds, for forty-five minutes; jar of wax too.

Nurse dons cap and mouthpiece, scrubs and dons sterile gown and gloves and prepares sterile table. She first takes pieces of wax paper and separates them before they get cold. Using artery forceps dip silk into hot wax and lay on large piece of wax paper. Then wrap each one carefully in small pieces of paper, folding over at both ends and place in envelopes. Dip flap of envelopes in wax and seal. Place envelopes in container.

As no antiseptic (carbolic, etc.) is used in wax, complete process as quickly as possible.

Linen Suture Yarn.—This is occasionally used, and is sterilized like silk.

Linen Bobbin for Tying the Cord.—Ordinary linen bobbin $\frac{1}{8}$ -inch wide is the best and cheapest material for tying the umbilical cord. It is cut into lengths of 15 inches, washed with soap and water, folded neatly, packed into a glass-stoppered bottle, and sterilized in the autoclave just like surgical dressings. In private practice two lengths are boiled with the scissors and kept in 1 per cent lysol solution until needed for tying the cord.

Basins, pitchers, douche=cans, bed=pans, etc., used during a labor are all to be sterilized. In private practice they are scrubbed and boiled for thirty minutes in the wash-boiler with the cover on, and then wrapped in sterile pillow-slips. If basins are required in a hurry, one granite basin may be inverted over another, water placed in the lower, and boiled for twenty minutes. China bowls and pitchers may be scrubbed with Sapolio, scalded with boiling water, and rinsed with 2 per cent lysol solution. If there is time, however, all the utensils should be boiled. In hospitals they are wrapped in special holders and sterilized in the steam sterilizer.

Rubber tubing when sterilized is liable to kink at the bends and prove useless when most urgently needed. To avoid this it should be rolled on a spool (Fig. 262).

Douche-bags of rubber are first washed out with table salt and water, using much friction to rid the interior of the sulphur and dust, then filled with gauze, and steamed or boiled. A douche-bag may not be used for intravenous injections. New rubber tubing intended for such injections must first be boiled in 4 per cent sodium hydrate solution. Kelly pads are not boiled, but scrubbed with soap and

water, and then with strong bichlorid or lysol solution. The author does not recommend Kelly pads.

Gowns, aprons, leggings, towels, sheets, and pillow-slips for use in the confinement room are wrapped in towels or special holders, pinned securely, labeled distinctly, and sterilized by steam for forty-five minutes. They are dried in the sterilizer and placed in a clean box or closet.

Tables, chairs, bed, and other furniture in the confinement room are washed with a soft cloth and soap and

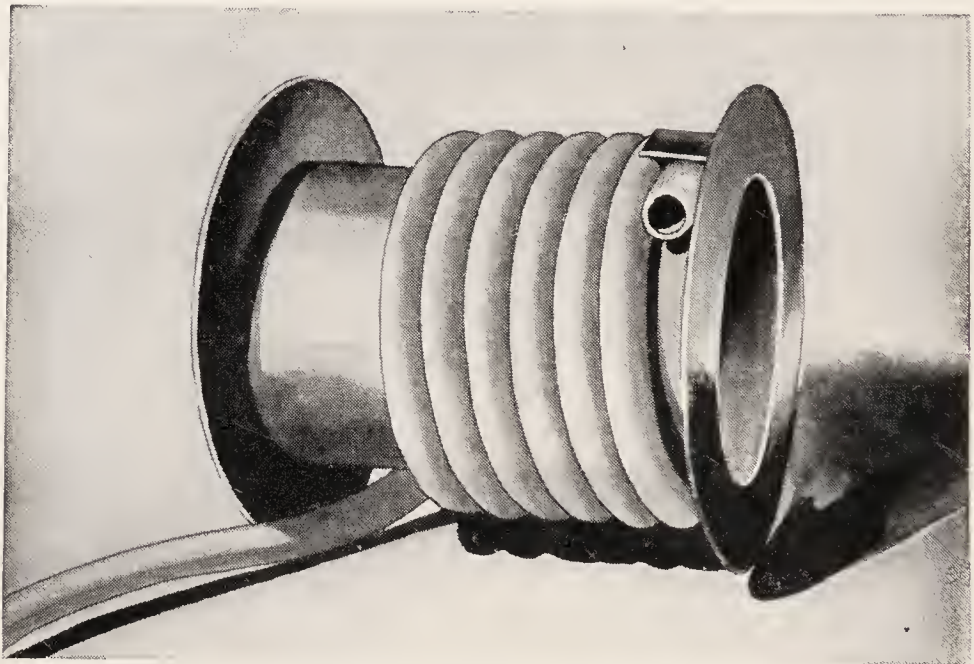


Fig. 262. —Nickel-plated copper reel on which the douche-can tube is sterilized, to prevent kinking.

water, then with 1:1000 bichlorid or 3 per cent carbolic acid solution. In hospitals, where pus is present, this sterilization must be particularly thorough, and in all instances the tables are covered with sterile mattress padding and towels during operations, so that sharp-pointed needles may not pierce through and be infected from the table top underneath.

Mattresses.—Hair mattresses may not be put in the steam sterilizer. They are exposed to the sun and air for

two or three days. Then the cover is laundered and the mattress remade. The hair should also be exposed to the sun. The same treatment is given pillows.

Moss mattresses are destroyed if infected. Cotton felt ones are put through the pressure sterilizer.

The nurse should take care that the whole mattress is covered with impervious sheeting and she should not transfix this with pins, etc., when being used.

Sterilizing Apartments.—After infectious cases the room occupied by the patient is to be disinfected. A simple and very efficient method is the following: The room is allowed to air and sun thoroughly, several days if possible, all the windows being opened, the bedding scattered on chairs, closet doors left ajar, and bureau drawers drawn out. Then the room is tightly closed, the cracks, flues, and doors being sealed with paper. It is allowed to warm up thoroughly.

Formaldehyd vapor is generated as follows:

A 2-quart milk pail is wrapped in a piece of asbestos paper and set inside a papier-mâché water pail, dry. For a room 15 feet square 5 ounces of potassium permanganate are put in the tin pail. When everything is ready the nurse places the apparatus in the center of the room to be sterilized, then pours 20 ounces of formalin on the potash, and, holding her breath, beats a hasty retreat, closing and sealing the door behind her.

After twelve hours the room is widely opened and allowed to air thoroughly. If it is desired to dissipate the fumes of formalin quickly, ammonia may be spread around. The ceiling, floors, walls, and furniture are now washed with soap and water, using both very liberally, and new linen put on the bed.

Formaldehyd lamps are sometimes used for fumigating, but they are not more efficient than the method described, which is recommended by the Illinois State Board of

Health. Sulphur is seldom used now for fumigation. It ruins household articles, while formalin does not. Many health authorities claim that fumigation is inefficient and useless, therefore dispensable. In my opinion, the washing and airing of the room do more good than the fumigation.

A new and promising method of room disinfection is the electric arc lamp using carbons which produce a light particularly germicidal.

The nurse will note the frequent repetition of the advice "scrub with soap and water." Yes, when we remove the germs mechanically by scrubbing with soap and water we eliminate the greater part of the danger of conveying infection and leave little for the sterilizer or the antiseptic solution to do. Lawson Tait, one of the greatest abdominal surgeons, relied exclusively on soap and water.

PREPARATION OF SOLUTIONS

Authorities differ widely in their choice of antiseptic solutions, and the nurse will do best if she becomes thoroughly acquainted with the desires of her physician in this regard.

Sterile Water.—In hospitals this is prepared in the large sterilizers, being filtered before being boiled under pressure by steam or gas. In private homes the nurse should scrub the wash-boiler thoroughly with sand-soap, rinse it, and boil about 8 gallons of water for forty minutes, setting it to cool, well covered up. In country practice the water should be carefully strained through cotton, as it often contains foreign matter, sometimes living. A dipper should be boiled and kept, wrapped in a sterile pillow-slip, for ladling purposes. Hot sterile water may be taken from the tea-kettle, which should always be kept full and boiling on the stove. In flats or apartments in cities the nurse should

remember that between 1 and 5 A. M. the heat goes down and the hot-water supply may fail. Even in cities with a known good water-supply antiseptic solutions should always be made with previously sterilized water. One should not trust the antiseptic (bichlorid, lysol, creolin) to disinfect the water. An epidemic of tetanus is said to have resulted in a hospital where such trust was imposed in creolin. In all cases, therefore, where possible, boiled water should be employed.

Bichlorid of Mercury Solutions.—In private practice the nurse will use tablets, dissolving them in hot water and adding cool to bring up the required dilution. Strengths of 1:1000 and 1:1500 are usually employed. Too much caution cannot be enjoined to exercise care to avoid poisoning with bichlorid. In making up stock solutions of bichlorid, the powder or tablets should be completely dissolved in boiling water and the solution filtered through cotton. No bits of undissolved poison should be left in the bottle.

When used for douches, the solution must be injected under low pressure and a douche of sterile water given afterward. In anemic women or in cases of kidney or intestinal disease this poison must be used only with the greatest circumspection. Some physicians have discarded it entirely; the author uses it very little.

Mercuric iodid is sometimes used in strength of 1:4000 or 5000.

Acriflavin Compound.—Acriflavin (an antiseptic dye), 1 per cent, tincture of iodin, 2 per cent in glycerin.

Carbolic Acid Solution.—The pure crystals are mixed with 5 per cent of alcohol, or the 95 per cent acid may be purchased. To make a 5 per cent solution, the required amount is dissolved in boiling water with constant and vigorous stirring. No acid should form in globules in the bottle. After the acid is all dissolved and the solution

cooled, it is filtered through cotton in a glass funnel. To make 1 gallon of 5 per cent carbolic acid solution $6\frac{3}{4}$ ounces of the 95 per cent solution are needed. Phenol is another name for carbolic acid.

Lysol Solution.—Lysol is a proprietary antiseptic containing 60 per cent of kresol or cresylic acid, $7\frac{1}{2}$ per cent glycerin, water, and green soap. *Liquor cresolis compositus* is the official name for a similar preparation, which any chemist can prepare. Only for brevity is the proprietary name used in the text. It is employed in 1, $1\frac{1}{2}$, and 2 per cent solutions. In hospitals it is made up, as carbolic is, in 5 per cent solution ($6\frac{1}{2}$ ounces to the gallon), and diluted with sterile water as needed. In private practice the solutions are made from the pure drug: 3 drams to 1 quart of water make a 1 per cent solution. The nurse should always measure these drugs and not trust to guess work.

Formalin Solution.—For douches, 30 drops of fresh formalin are mixed with 1 pint of sterile water; for the hands, 1 dram to 1 pint.

Creolin is also used, like lysol.

Salt Solution.—For use as a wash or douche saline solution is prepared by adding 1 dram of pure sterilized table salt to 1 pint of water. When used for hypodermoclysis, the solution is prepared with boiling water and cooled down to the temperature desired. For intravenous use, doubly distilled water is necessary.

A convenient way to sterilize salt is to fill 2-dram vials, cork securely, and sterilize daily for three days, one hour each day. A 2-dram vial contains just enough salt to make 1 quart of 0.6 per cent solution. If the solution must be made in the absence of prepared salt, the boiling must be done after the salt is dissolved. (See p. 313.) Salt solution should be made fresh, just before injection. It does not keep well, being decomposed by impurities in the glass container, and also becoming infected from the air.

Boric Acid Solution.—Boric or boracic acid dissolves in water only to 4 per cent, and this is the strength usually employed. Twelve ounces of the crystals are placed in a sterile gallon bottle and boiling water poured in. The bottle is shaken vigorously until all the crystals are dissolved; then it is set in a cold place. When the excess of boric acid has crystallized out, the clear solution may be decanted from the top into a separate bottle. This is better than to use the bottle with the crystals at the bottom as they often are poured out when not wanted. We have practically discarded boric acid solutions, finding that salt solution is better.

T. G. C. Jelly.—For lubricating the gloves in rectal examinations, the catheters, and rectal tubes a jelly is useful. At the Chicago Lying-in Hospital it is made as follows: Gum tragacanth, $\frac{1}{2}$ oz.; glycerin, 1 oz.; carbolic acid, 1 dram; water, q. s. ad. 28 oz. Gum tragacanth is dissolved in water to proper consistency, glycerin is added, and as antiseptic, carbolic acid, 0.4 per cent. The mixture is sterilized in the autoclave, poured into previously sterilized collapsible tubes, which are closed by folding the end down with a sterile knife or letter opener.

CONTENTS OF DRUMS AT THE CHICAGO LYING-IN HOSPITAL

At the Chicago Lying-in Hospital the sterile materials needful for a labor, a laparotomy, etc., are assembled in large metal containers, and a good supply of these sterilized drums is kept constantly available. Each hospital naturally develops its own special technic, depending on the environment, the clientele, and the desires of the surgical staff. The drums, as filled at the Chicago Lying-in

Hospital, are here described, and these lists may be helpful to other institutions in preparing a technic.

LABOR DRUM

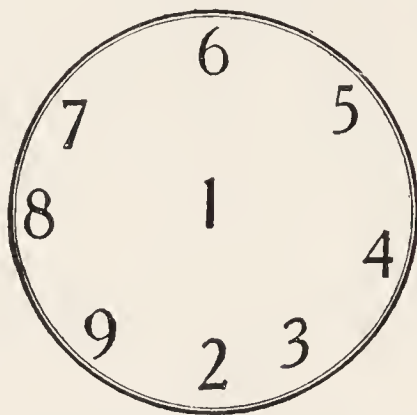


Fig. 263.—Labor drum.

1. Two placenta basins.
2. One sheet.
3. One abdominal binder and pad holder.
4. Two vulva pads.
5. Two packages of 6 drawn gauze sponges.

6. Four towels.

7. Three towels.

8. Baby receiver, weighed and noted.

Binder with safety-pin.

Cord dressing.

One cord tape with numbered tag.

Two tapes with number for mother and baby.

Four mouth wipes.

One small towel.

9. One pair muslin leggings.

On top of these are placed in order, from below up, the following:

10. One small turkish pad.
11. One large turkish pad.
12. Sterilizer control.
13. Safety pins.
14. One sheet.

15. One quilted table pad.
16. Small towel placed immediately beneath drum cover.

GOWN DRUM

The gowns are folded small, with sleeves and outside turned in, and packed around the outside of the drum.

- | | | |
|----|---|--------|
| 1. | } | Gowns. |
| 2. | | |
| 3. | | |
| 4. | | |
| 5. | | |

In the center are placed in order, from below up, the following:

6. Four hand towels.
7. One gown.
8. Two towels.

LAPAROTOMY DRUM No. 1

1. One small lap sheet.
2. Three sheets.
3. One sheet.
4. One sheet.
5. One large lap sheet.

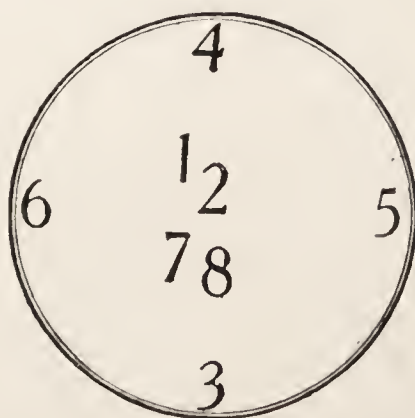


Fig. 264.—Laparotomy drum No. 1

6. One instrument table cover.
7. One sterilizer control.
8. One quilted table pad.

LAPAROTOMY DRUM No. 2



Fig. 265.—Laparotomy drum No. 2.

1. Six towels. Four pairs sleeves.
2. Eighteen large lap sponges.
3. { Eighteen small lap sponges.
4. { (In packages of 6.)
5. One abdominal binder and pad holder.
6. Two vulva pads.
7. Two combinations.
8. Two compresses.
9. Eighteen drawn gauze sponges (in packages of 6).
10. Powdered salt (for salt solution for lap sponges).

On top of these are placed in order, from below up, the following:

11. One long narrow laparotomy sponge.
12. Safety-pins.
13. Sterilizer control.

VAGINAL DRUM



Fig. 266.—Vaginal drum.

1. Six towels.
 2. Two packages of 6 drawn gauze sponges.
 3. One sheet.
 4. Three sheets.
 5. One sheet.
 6. One fundus binder and pad holder.
 7. Two vulva pads.
 8. One package (6) drawn gauze sponges.
- On top of these:
9. Safety-pins.
 10. Sterilizer control.
 11. One quilted table pad.
-

THE OBSTETRIC NURSE

The author wishes that more nurses would prepare themselves for obstetric work and adopt it as a specialty. True, it is hard, but a woman in good health, who knows how to manage things, can systematize her duties so that she will get along very comfortably. If, in addition, the nurse will insist on a proper amount of sleep and opportunity for outdoor recreation being afforded her, she will enjoy long years of usefulness in this fascinating branch of medicine. Nurses often take too little rest and do not go out at all during the first week. In well-to-do families the nurse should be relieved at night by another, and in those less fortunate some one will be accessible for relief of the nurse by day. The nurse must not think this is selfish—on the contrary, she will do better work for both mother and babe if she is well and strong. Obstetric nurses often form most intimate and pleasant friendships with their patients, and they find they have a personal interest and satisfaction in seeing the child grow and develop. This alone should attract to this specialty the best women in the profession. In the last analysis the nursing instinct is but the sublimated maternal

instinct. Lately the field of nursing is being much widened. In the chapter on Prenatal Care we have shown how the

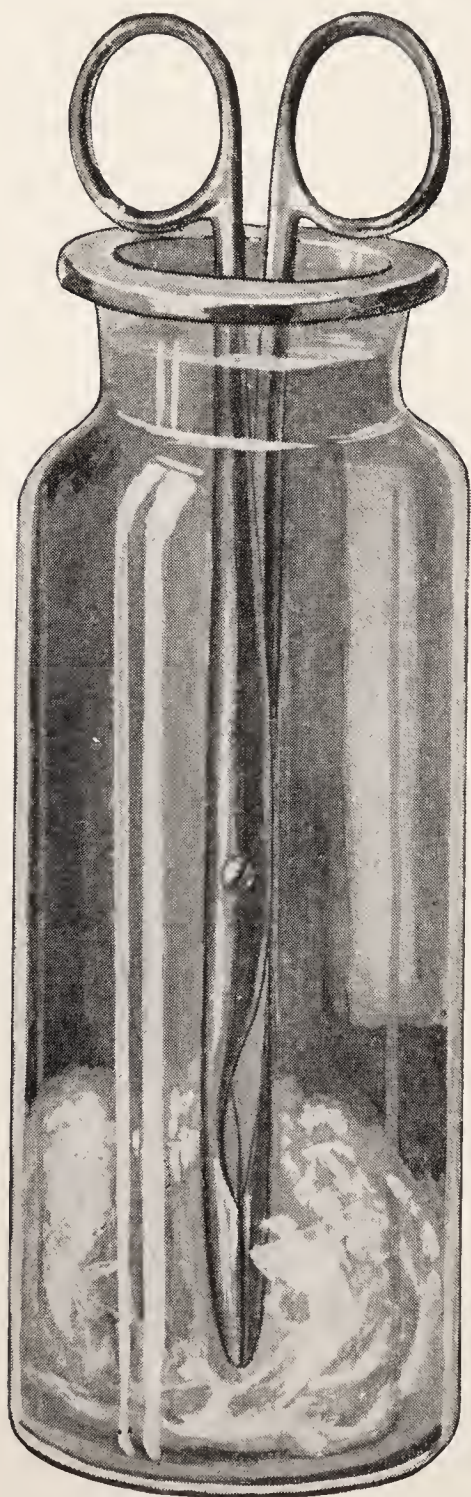


Fig. 267.—Nurse's dressing forceps in tall bottle of lysol solution.

nurse can be of real service to the pregnant woman, to the physician, and to the state. We need teachers of health, and the obstetric nurse is in a peculiarly happy position to give such instruction.

To do good work, the nurse should be well prepared, and she should have her affairs so arranged that she is accessible at all times and ready for all emergencies. She should have her satchel packed at all times when awaiting a call. She should read up her cases and do some postgraduate work occasionally to save herself from rustiness. She should take with her to the obstetric case a book on obstetric nursing and consult it when anything unusual arises.

LIST OF ARTICLES NEEDED BY OBSTETRIC NURSE

One hypodermic syringe and needles in working order.

Two tested thermometers, one for mother and one for babe.

One razor, safety pattern.

One pair surgical scissors.

One pair tissue forceps.

One long dressing forceps for use during labor in handling sterile things (Fig. 267).

- One pair rubber gloves.
- One rectal tube.
- One sterile douche-bag or can.
- One portable sterilizer.
- One white operating gown.

It is better if the patient provides her own rubber goods, but in country practice the nurse may need to carry them. Some nurses find a Kelly pad useful, but just as good a pad may be made with newspapers.

The Nurse's Dress.—This should always be of wash material, of a quiet, restful color, and *should not be worn in the street*. This is neither good taste nor asepsis. The sleeves should be made so that they may be rolled up above the elbow, and stiff cuffs should not be worn. They rub into the infant's eyes when the child is "changed" and may injure them. It might be added that the nurse should always appear neat and clean while on duty. During the night the nurse is so frequently disturbed that some form of wrapper should be provided. Except in rare instances the nurse should never try to rest in her uniform.

Face powder should not be used by the nurse when on operating-room duty. It blows off on to the sterile field and may cause infection (Horner).

Deportment.—A discussion of this point is not needed in this book, but a few bits of advice may not be out of place.

Never forget the dignity of the profession of nursing; at the same time, always remember that even menial duties are compatible with it and even may be demanded.

The rules of asepsis must never be neglected or relaxed in severity, even if the physician does not practice them or if the circumstances are difficult to control. The keenest and most constant attention to the details of asepsis alone will guarantee the puerperal woman the safety she so richly deserves. The practice of perfect asepsis requires great labor and sacrifice on the part of the nurse, but it

is easy for her if she but possesses that which "is the fulfilling of the law."

The lying-in chamber should always be neat, temperate, and inviting, and the disturbing elements of the world outside of it should never enter.

The nurse should, under no circumstances, allow disagreements to arise between herself and the servants, and when the mother of the house is ill she should aid as much as possible in the conduct of the household affairs. She should increase the duties of the family and the servants as little as possible.

The nurse should never gossip about her cases. Family secrets are too sacred to be even hinted at or to be referred to without names. He who tells even the smallest part of a secret loses his hold on the rest. People can often draw inferences which render the information direct. This bit of advice cannot be too deeply impressed.

The nurse—and the doctor too—must abstain from the relation of bad cases or wonderful operations, etc., because the patient easily takes alarm and will imagine herself to be singled out for each accident related. The nurse must allow no complication to disturb the evenness of her mind and action, and if the doctor is to be called for some complication, the patient must not know it.

The nurse should not allow the infant to acquire bad habits, such as sucking the fingers, sucking an empty rubber nipple, water-tipling, peppermint- and sugar-water-tipling, or even the whisky habit, or lying with its mother or other person. By gentle persistence the nurse may engender good habits of living at a very tender age, for which the individual may be grateful all his days.

VENEREAL DISEASES

Unfortunately, these affections or "social diseases" are not uncommon in the obstetric practice, although usually we see the effects only, not the disease in its florid stages.

Gonorrhea.—This is an inflammation of the urethra and vulva produced by the gonococcus of Neisser. It affects the pelvic organs slowly, one after the other, and causes chronic inflammatory changes of permanent character in them. Sterility from tubal disease or pelvic abscess may result, and if pregnancy supervenes, puerperal peritonitis may be the final outcome.

If a child is born before the disease is cured, the gonorrheal germ may obtain access to the eyes and cause an inflammation resulting in blindness. (See p. 465.) The discharges from a gonorrheal case are highly infectious. The woman may infect her own eyes, she may carry the infection to others, and cases are known where infected towels caused epidemics of gonorrheal vulvitis in schools for girls.

Thus the nurse may appreciate the importance of treating a case of gonorrhea as she would the other infectious diseases.

The symptoms of pelvic gonorrhea are pain, smarting on urination, pain and soreness in the pelvis, discharge of greenish-yellow pus, slight febrile movements, and, later, the symptoms of disease of the organ most affected, as pyosalpinx or peritonitis.

During pregnancy the disease aggravates, the discharge being very profuse and often fetid and irritating. Warty growths may appear on the genitals, and an eczema intertrigo develop there.

Treatment.—The physician will order medicines to keep the urine in an antiseptic condition. Douches of various antiseptics may be prescribed, the vulva and vagina may be painted with iodine, nitrate of silver, etc., or tampons of ichthyol inserted. Iodoform gauze packing is occasionally employed. It is wisest to get the disease well on the road to cure before the child is born, to avoid ophthalmia neonatorum and puerperal peritonitis.

During labor the vagina may have to be douched with lysol solution, and after the infant is born exceedingly rigorous precautions are observed to prevent any infection gaining access to the eyes.

Syphilis or "Specific Disease."—The latter term is used so that the laity may not understand the harsh meaning of the diagnosis. While gonorrhea is usually a local affection, syphilis is a blood disease, becoming at once a constitutional taint which is almost ineradicable, and is transmissible even to the third generation.

There are three stages in the disease: The first stage is the primary sore or the point of entrance of the infection. This is a hard ulcer and may occur on the vulva, in the vagina, or on any part of the body, as the lip, the tonsil, or the hand, as not infrequently happens to physicians in their gynecologic examinations. Syphilis is not always venereal in origin. Lues is another name for syphilis.

The second stage begins six to ten weeks after the sore appears, and is evidenced by a rose-red, fading to copper colored, general eruption, headache, falling hair, pains in the bones, and sore throat. There are superficial ulcers in the mouth and around the vulva and anus. In these two stages the disease is highly infectious. The Wassermann blood test is one of the strongest evidences of the disease. In late pregnancy, however, a "positive Wassermann" must be accepted with a little caution.

The third or tertiary stage occurs later in life, perhaps after many years, and shows the effects of the disease in the bones, blood-vessels, vital organs, and nervous system.

If a man marries while in the first or second stages, he transmits the affection to his wife and to the offspring. If the disease has no external signs—is latent—he transmits the poison to the offspring, the mother being infected from the child. In the former case, abortion or premature labor usually terminates the pregnancy. In the latter

case, a dead and maccrated or a live but syphilitic infant is born.

Signs of syphilis in the newborn child are: a general skin eruption of rose spots; blebs on the soles and palms; snuffles; cracks and superficial ulcers around the anus and mouth; excessive crying due to tender joints; marasmus, and the Wassermann blood test. (See Plate IV opposite p. 460.)

Should a nurse notice the symptoms mentioned in either the mother or child, the physician must be notified.

Prenatal care includes the discovery of possible syphilis. Then the mother may be treated and the possibility of delivery of a healthy child improved.

Prevention of Contagion.—The syphilitic patient must have her own knife, fork, dishes, etc. Discharges are collected in antiseptic dressings, which are burned. The nurse must care for her own hands with the utmost regard, using rubber gloves during necessary contact with infected parts, as sore mouth and ulcerated genitals. The same precautions are to be observed in handling a syphilitic infant. None but the mother will be allowed to nurse a syphilitic child.

Treatment.—During pregnancy the disease becomes more virulent, and at all times it requires vigorous treatment. Mercurial baths, mercurial inunctions, hypodermic injections of mercury, salvarsan ("606"), internal administration of mercury, are all employed. Iodid of potassium is given later. As these drugs are given in large and increasing doses, the nurse will watch for *mercurialization* (salivation, fetid breath, sore mouth, loosening of the teeth, etc.); *iodism* (frontal headache, coryza, stiffness in throat, pustular eruption on the face and body); and *arsenical poisoning* (nausea, vomiting, diarrhea, prostration, edema). Tonic medicines are also given, as a severe form of anemia often develops.

The treatment of a syphilitic child is the same in principle as that of the adult.

General Consideration of Venereal Disease.—A nurse must never let the patient know that she has discovered such an affection.

It must not be thought that because a patient has venereal disease it must have been acquired in illicit relations. Physicians and nurses have acquired syphilis in the course of their work. Men have acquired it in the barber's chair; washwomen, from washing infected linen; patients in the dentist's chair or under operation, from infected instruments. A physician, using a eustachian catheter, infected 35 patients with syphilis!

These same possibilities exist with gonorrhea. Guarded speech, therefore, is obligatory on the nurse, as scandal is easily started and endless domestic woe may be inaugurated by the nurse dropping the merest hint regarding the nature of the malady. If she is questioned regarding the manifestations of disease, she should quietly but firmly refer the inquiry to the physician. Nor may she speak of the disease or of its symptoms to any of her friends or other physicians, as they may recognize the description and connect it with the patient.

“He who tells even the smallest part of a secret loses his hold on the rest.”

DIETARY

LIST OF DIETS

Absolute Milk Diet.—Milk, whey, matzoon, koumiss, buttermilk, junket, water. Three quarts of milk daily are given, a glassful every two hours.

Liquid Diet.—Water, milk, matzoon, koumiss, junket, buttermilk, whey, tea, coffee, toast-water, rice-water, egg-

water, strained lemonade and other fruit juices, broths, beef-tea, beef-juice, oyster stew minus oysters, ice-cream, strained gruels and cream soups, junket, gelatin.

Semisolid Diet.—All the above plus egg-nog, milk-toast, cereal foods (boiled), corn-starch pudding, blanc-mange, soft-boiled eggs, scraped beef, cream soups, purées and soups thickened with rice, barley, or farina.

Special Perineorrhaphy Diet.—(See p. 206.)

Non=protein Diet.—Water, vegetables (no peas or beans), cereals with sugar or honey, or syrup, potatoes with butter. Very little salt and very little cream. Lettuce, spinach, celery, and fruits.

Pre=eclamptic Diet.—Reduce salt 60 per cent. Allow 25 grams of animal protein (milk, cheese, meat, egg) per day. Give orange juice, starches, sugars, leafy vegetables (no peas, beans or lentils) to make 1500 calories. No tea or coffee. Total liquid intake should be adjusted so that it exceeds renal output about 500 cc.

Diet for the Prevention of Overgrowth of the Child.

We have learned that it is impossible to influence the size of the child through dieting the mother. Short of actual famine there is no effect from reduction or alteration of the food. The great hunger experience in Germany during the War blockade proved this. The babies were as large and as rosy as ever—even when the mothers were half-starved.

RECIPES¹

Albumen= or Egg=water.—Stir white of one egg in a pint of water ice cold. Do not beat or shake. Sugar, salt, or powdered cinnamon to taste.

Barley=water.—Wash 2 ounces (wineglassful) of pearl barley with cold water. Boil five minutes in fresh water. Decant water. Pour on 2 quarts of boiling water; boil down to 1 quart. Flavor with thinly cut lemon-rind, add sugar or cinnamon to taste; strain.

If the mixture is allowed to boil down to 1 pint, strained, and put on ice, a good barley-jelly results.

¹ Largely from 'Thomas' Dietary.

Beef=tea.—Free 1 pound of lean beef from fat, tendon, cartilage, bone, and vessels; chop fine, put into 1 pint of cold water to digest two hours. Simmer on range or stove three hours, but *do not boil*. Make up for water lost by adding cold water, so that 1 pint of beef-tea represents 1 pound of beef. Strain through cheese-cloth without pressure. Should be clear.

Beef=juice.—Cut a thin, juicy steak into pieces $1\frac{1}{2}$ inches square; brown separately one and one-half minutes on each side over a hot fire; squeeze in a hot lemon-squeezer or meat-press; flavor with salt and pepper. May add to milk or pour on toast.

Beef=tea with Acid.—One and a half pounds of beef (round) cut in small pieces; same quantity of ice, broken small. Let stand in deep vessel twelve hours. Strain thoroughly and forcibly through coarse towel. Boil quickly ten minutes in porcelain vessel. Let cool. Add $\frac{1}{2}$ teaspoonful of acid (dilute phosphoric acid) or acid phosphate to the pint.

Cereal Extract.—Take 2 soup-spoonfuls each of corn, barley, oats, rye, and bran; boil in 4 quarts of water three hours; allow to cool and then strain. If necessary, add enough water to make 1 quart. A palatable yellowish fluid is obtained, which may be improved by the addition of milk or powdered cinnamon for children.

Chicken Broth.—Skin and chop fine a small chicken or half a large fowl; boil it, bones and all, with a blade of mace, a sprig of parsley, a tablespoonful of rice, and a crust of bread in 1 quart of water for an hour, skimming it from time to time. Strain through soup-strainer.

Clam Broth.—Wash thoroughly 6 large clams in shell; put in kettle with 1 cup of water; bring to boil and keep there one minute; the shells open, the water takes up the proper quantity of juice, and the broth is ready to pour off and serve hot.

Champagne Whey.—Boil $\frac{1}{2}$ pint of milk; strain through cheese-cloth. Add wineglassful of champagne.

Egg Lemonade.—Beat 1 egg with 1 tablespoonful of sugar until very light; stir in 3 tablespoonfuls of cold water and juice of small lemon; fill glass with pounded ice, shake in milk-shaker for fully two minutes, pour in clean glass. Should be drunk through straw.

Eggnog.—Scald some new milk by putting it, contained in a jug, into saucepan of boiling water, but *do not allow it to boil*. When cold, beat fresh egg with a fork in a tumbler with some sugar. Beat to a froth, add a dessertspoonful of brandy, and fill tumbler with scalded milk. Serve cold. May shake with ice in milk-shaker; strain. If desired, may use sherry instead of brandy, or omit the alcohol entirely, and grate a little nutmeg or cinnamon in glass.

Flaxseed Tea.—Flaxseed (whole), 1 ounce; white sugar, 1 ounce (heaped tablespoonful); licorice-root; $\frac{1}{2}$ ounce (2 small sticks, crushed well); lemon-juice, 4 tablespoonfuls. Pour on these materials 2 pints of boiling water; let stand in a hot place four hours; strain off the liquor.

Flour=ball.—Take 1 pint of flour and pack tightly in small muslin bag; throw into boiling water and boil five or six hours; cut off the outer sodden portion; grate the hard core fine; blend thoroughly with a little milk, and stir into boiling milk to the desired thickness.

Gum=arabic Water.—Dissolve 1 ounce of gum arabic in 1 pint of boiling water; add 2 tablespoonfuls of sugar, a wineglassful of sherry, and juice of a large lemon; cool and add ice.

Junket.—Heat 1 pint of fresh milk just luke-warm; add 1 teaspoonful of essence of pepsin or half a rennet tablet; stir enough to mix. Flavor, if desired, with sugar, grated nutmeg, and brandy. Pour into eustard cups; let stand in cool place until firmly curded.

Koumiss.—Take citrate of magnesia bottle with shifting cork; put in it 1 pint of milk; $\frac{1}{6}$ cake of Fleischmann's yeast, or 1 tablespoonful of fresh lager-beer yeast (brewers'), $\frac{1}{2}$ tablespoonful of white sugar, reduced to syrup; shake well and allow to stand in refrigerator two or three days, when it may be used. It will keep there indefinitely if laid on its side. Much waste can be saved by preparing the bottles with ordinary corks wired in position and drawing off the koumiss with a champagne tap.

Meat Cure.—Procure slice of steak from top of round—fresh meat without fat; cut meat into strips, removing all fat, gristle, etc., with knife. Put meat through mineer at least twice. The pulp must then be well beaten in roomy saucepan with cold water or skimmed beef-tea to consistence of cream. The right proportion is 1 teaspoonful of liquid to 8 of pulp; add black pepper and salt to taste; stir minee briskly with wooden spoon the whole time it is cooking, over slow fire or on cool part of covered range, until hot through and through and the red color disappears. This requires about one-half hour. When done, it should be a soft, smooth, stiff purée of the consistence of a thick paste. Serve hot. Add for first few meals the softly poached white of an egg.

Meat Diet, Raw.—Scrape pulp from a good steak, season to taste, spread on thin slices of bread; sear bread slightly and serve as sandwich.

Meat=extract Ice.—Express all the juice from 1 pound of fresh beef. Add $\frac{1}{4}$ pound of sugar, 3 teaspoonfuls of fresh lemon-juice (except in dyspeptics), 1 tablespoonful of cognac, well stirred with yolks of 3 eggs. May flavor with vanilla. Freeze.

Milk and Egg.—Beat milk with salt to taste; beat white of egg until stiff; add egg to milk and stir. Flavor with grated nutmeg or cinnamon.

Milk Digested with Acid.—Add 20 drops of dilute hydrochloric acid to 1 pint of water; stir, add the acidulated water to 1 quart of fresh milk, stirring as it is added. If the milk is not alkaline, make it so before adding the water by adding lime-water until litmus-paper shows the proper reaction; boil twenty minutes on a slow fire in narrow-necked vessel to prevent too much evaporation. The proportions of milk and water may be modified to suit the case.

Milk, Peptonized: Cold Process.—In a clean quart bottle put 1 peptonizing powder (extract of pancreas, 5 grains; bicarbonate of soda, 15 grains) or the contents of one peptonizing tube (Fairchild); add 1 teacup of cold water; shake; add 1 pint of fresh cold milk; shake the mixture again. Place on ice; use when required without subjecting to heat.

Warm Process.—Mix peptonizing powder with water and milk as described above; place bottle in water so hot that the whole hand can be held in it for a minute without discomfort; keep the bottle there ten minutes; then put on ice to check further digestion. Do not peptonize long enough to render milk bitter.

Milk=toast, Peptonized.—Over 2 slices of toast pour 1 gill of peptonized milk (cold process); let stand on back of stove for thirty minutes. Serve warm, or strain and serve fluid portion alone. Plain light sponge-cake may be similarly given.

Milk, Sterilized.—Put the required amount of milk in clean bottles (if for infants, each bottle holding enough for one feeding). Plug mouths lightly with rubber stoppers or non-absorbent cotton; immerse to shoulders in kettle of cold water; boil twenty minutes or, better, steam thirty minutes in ordinary steamer; push stoppers in firmly; cool bottles rapidly and keep in refrigerator. Warm each bottle just before using.

Milk=shake.—White of 1 egg, 1 dram of sugar, 2 table-spoonfuls of chipped ice, 1 ounce of cream. Shake in milk-shaker two minutes. Add cold milk to fill glass; flavor with vanilla or lemon.

Mutton Broth.—Lean loin of mutton, $1\frac{1}{2}$ pounds, including bone; water, 3 pints. Boil gently until tender, throwing in a little salt and onion, according to taste. Pour broth into saucepan; when cold, skim off fat. Warm up as wanted.

Nutritious Coffee.—Dissolve a little isinglass or gelatin (Knox) in water; put $\frac{1}{2}$ ounce of freshly ground coffee into saucepan with 1 pint of new milk, which should be nearly boiling before the coffee is added; boil both together for three minutes. Clear it by pouring

some of it into a cup and dashing it back again; add the isinglass, and leave it to settle on back of stove for a few minutes. Beat an egg in a breakfast-cup and pour the coffee upon it; if preferred, drink without the egg.

Rice=water.—Pick over and wash 2 tablespoonfuls of rice; put into granite saucepan with 1 quart of boiling water; simmer two hours, when rice should be softened and partially dissolved; strain; add saltspoonful of salt; serve warm or cold. May add 2 tablespoonfuls of sherry or port.

Rum Punch.—White sugar, 2 teaspoonfuls; 1 egg, stirred and beaten; warm milk, 1 large wineglassful; Jamaica rum, 2 to 4 teaspoonfuls; nutmeg.

Toast=water.—Toast 3 slices of stale bread to dark brown, but do not burn; put into a pitcher; pour over them 1 quart of boiling water; cover closely and let stand on ice until cold; strain. May add wine and sugar.

Vitamins.—Fat-soluble vitamins are found in cream, butter, eggs, fat sweetbreads, liver, cod-liver oil. Water-soluble vitamins are in yeast, spinach, lettuce, celery, potatoes, carrots, tomatoes, cabbage, oranges, lemons.

Whey.—Boil 1 pint of milk with 1 or 2 teaspoonfuls of lemon-juice; strain in muslin, expressing all fluid from the curd. Break the curd up first, and much fat and some finely divided casein will be expressed with the whey. For infants, use rennet tablet or junket tablet, $\frac{1}{2}$ grain to 1 pint, and keep warm ten minutes. If no fat is wanted, strain gently through fine napkin.

Wine Whey.—Put 2 pints of new milk in saucepan and stir over clear fire until nearly boiling; then add 1 gill (2 wineglassfuls) of sherry and simmer one-quarter of an hour, skimming curd as it rises. Add 1 tablespoonful more sherry, and skim again for a few minutes; strain through coarse muslin. May use 2 tablespoonfuls of lemon-juice instead of wine.

RECTAL FEEDING

The latest scientific studies have convinced us that the rectum does not absorb enough food to support life. Indeed, only sugar (dextrose or glucose) and alcohol are thus absorbed, and neither in sufficient quantities to preserve any degree of nutrition. Water enters the system most rapidly from the rectum. Drugs are absorbed more or less readily. Sodium

bicarbonate, caffein (strong coffee), digitalis, quinin, ether, opium, ergot, belladonna, all can be administered per rectum, and the nurse should watch for their physiologic effects.

Drugs must be given well diluted with water to avoid the irritation which would cause the rectum to expel its contents, and soon become intolerant of all medication.

Glucose (dextrose) should not be given stronger than $\frac{1}{2}$ per cent and sodium bicarbonate no more concentrated than $\frac{1}{2}$ per cent.

The nurse can do much to help the patient retain the clyisma. Have the fluid at body temperature, put patient on her left side, expel all air from the tube; lubricate the tube with vaselin (not glycerin); inject very slowly by the drip method if possible, 60 drops per minute, more or less, according to the urgency of the case or the tolerance of the patient; hold a soft compress over the anus for fifteen to twenty minutes after the injection; obtain the co-operation of the patient. In some cases it may be necessary to put some opiate into the rectum or cocainize painful hemorrhoids. These are "Harrison" prescriptions, and must be written in ink and signed by the physician.

FEEDING THROUGH THE SKIN

One may introduce a small amount of nourishment through the skin by inunctions of lard. This is especially valuable in babies with wasting diseases.

Hypodermically, salt solution may be injected in large quantities—up to 4 quarts daily—to replace liquid losses from profuse diarrhea or constant vomiting, as in hyperemesis gravidarum. Glucose (dextrose) solutions are sometimes given intravenously and hypodermically by the continuous drip method.

They should be made up of **freshly distilled** water, and if given under the skin may not be stronger than 5 per cent.

Soda Solution.—Baking soda, sodium bicarbonate, in 1 to 2 per cent solution is given intravenously in some cases of acidosis (where the alkalinity of the blood is reduced), *e. g.*, pre-eclamptic toxemia, hyperemesis, diabetes. It is prepared like salt solution, but, since boiling changes the bicarbonate to the slightly caustic carbonate (or washing soda), the nurse simply adds to sterile water the chemically pure (C. P.) salt as it comes from the wholesale chemist in *sealed* containers. It is sterile until exposed.

DUODENAL FEEDING

In cases of hyperemesis gravidarum it is sometimes possible to pass the duodenal tube of Rehfuess (Fig. 268) beyond the pylorus or into the jejunum, and, through it, supply water and food for days or weeks. The tube should be proved clear and clean, then boiled for five minutes.

The patient, lying on her right side, swallows the "bucket" (little silver olive-shaped bulb), and after it is in the stomach the nurse gives the patient a few ounces of water to drink. The patient then swallows once every few minutes while the nurse pushes the slender tube further, $\frac{1}{2}$ inch at a time, consuming as much as one-half hour in the operation. Marks on the tube indicate when the bucket has passed the pylorus. It may be allowed to go 20 to 30 inches beyond the pylorus into the jejunum.

The food container is adjusted as for the Murphy drip and the liquid is allowed to go in 1 drop per second.

The foods usually given are: Water, glucose solution, peptonized milk, eggs, fruit juices, and medicines. All must be carefully strained through 3 layers of gauze, otherwise solid particles will stop up the tiny tube. The food is kept warm by having the tube, near the mouth, pass through a rolled electric heating pad or under a hot-water bag.

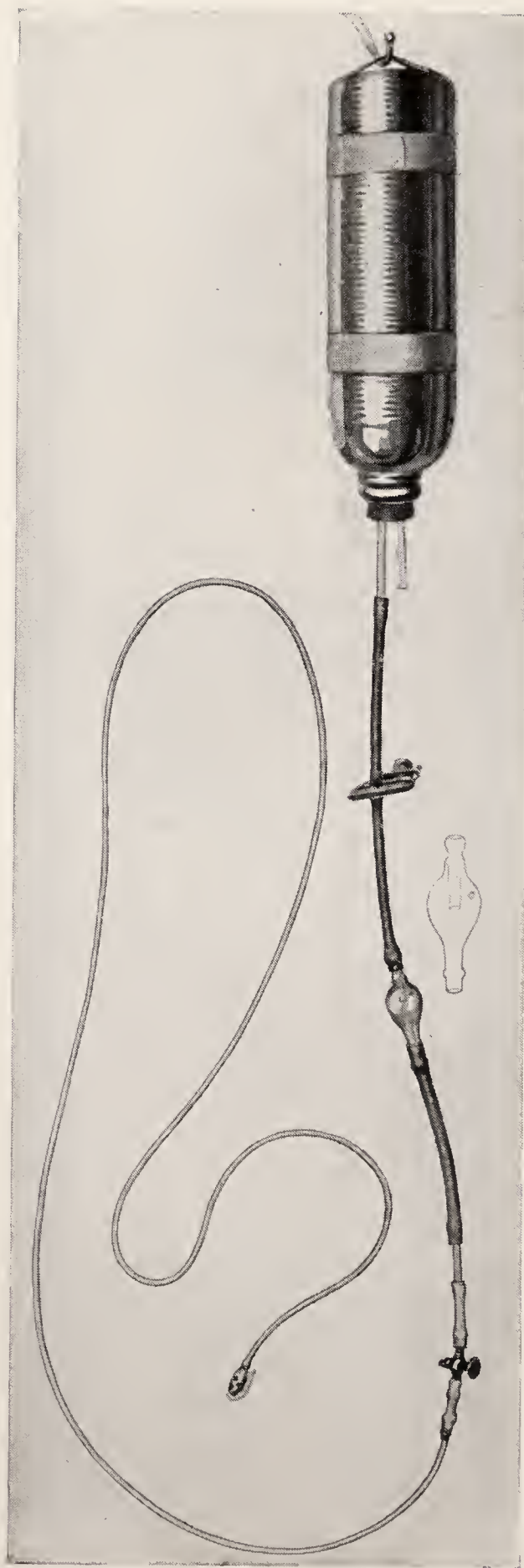


Fig. 268.—The duodenal feeding apparatus.

NASAL FEEDING

A delicate catheter is passed through one nostril to a point about half way down the esophagus (Fig. 269). It

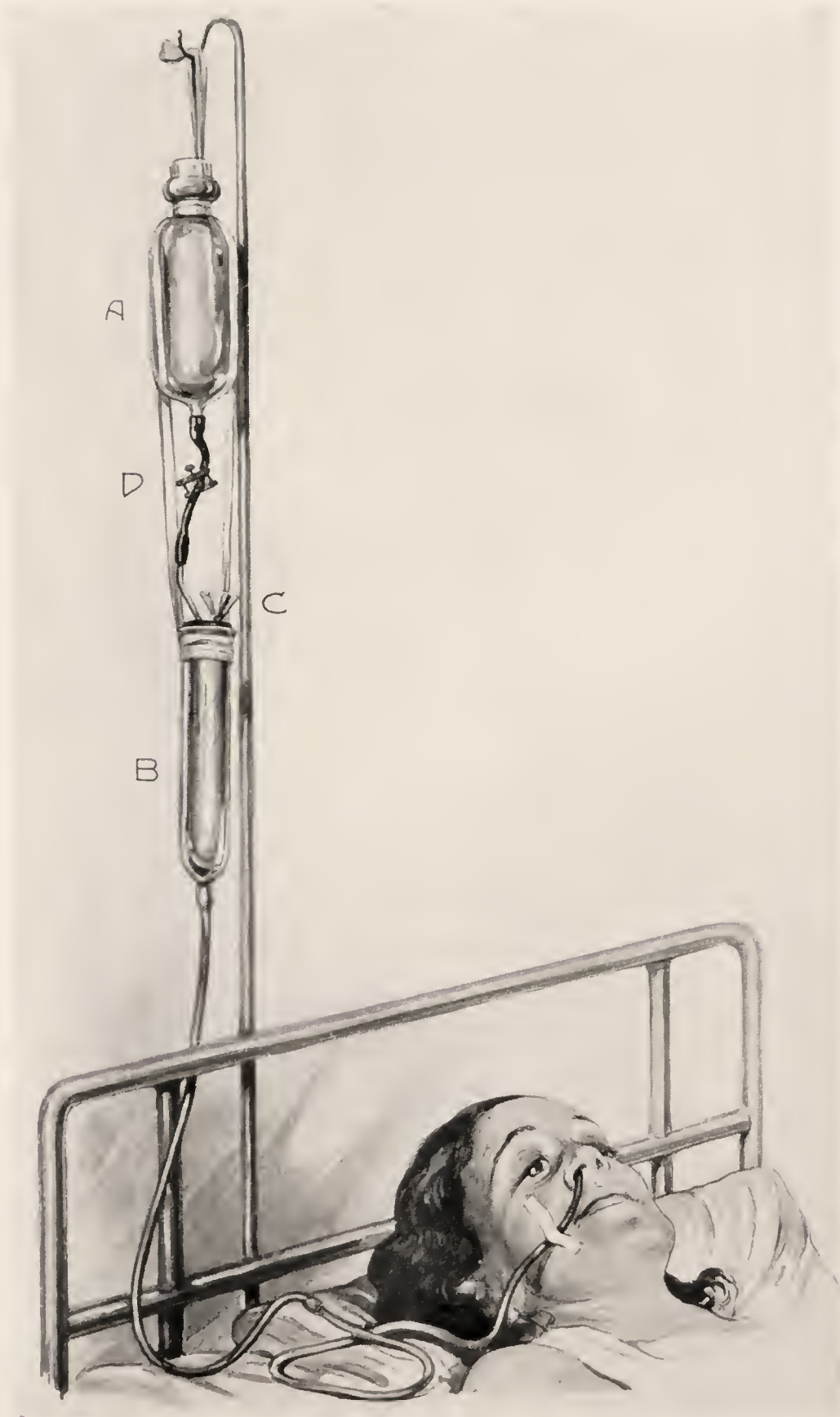


Fig. 269.—Nasal feeding ensemble, devised by Dr. Dieckmann. A, Stock solution; B, salvarsan buret for measuring; C, funnel for medication; D, pinch cock.

may be left in several days. Through it all liquid foods and medicines are given. Useful in hyperemesis.

CONTINUOUS INTRAVENOUS TREATMENT

In acute exhausting diseases like sepsis or peritonitis we sometimes fasten a gold cannula in an arm vein and let glucose or salt solutions run in for hours or days. An apparatus similar to that shown in Fig. 268 is used. For details see article by Mildred C. Boeke, R. N., *American Journal of Nursing*, Sept., 1932, p. 934.

AVOIRDUPOIS—METRIC CHART FOR BABIES

Pounds >	0	1	2	3	4	5	6	7	8	9	10	11	12	< Pounds
Ounces $\hat{>}$		453	907	1360	1814	2267	2721	3175	3628	4082	4535	4989	5443	Ounces $\hat{>}$
1	28	481	935	1389	1842	2296	2749	3203	3657	4110	4564	5017	5471	1
2	56	510	963	1417	1871	2324	2778	3231	3685	4139	4592	5046	5499	2
3	85	538	992	1445	1899	2352	2806	3260	3713	4167	4620	5074	5528	3
4	113	567	1020	1474	1927	2381	2835	3288	3742	4195	4649	5102	5556	4
5	141	595	1048	1502	1956	2409	2863	3316	3770	4224	4677	5131	5584	5
6	170	623	1077	1530	1984	2438	2891	3345	3798	4252	4706	5159	5613	6
7	198	652	1105	1559	2012	2466	2920	3373	3827	4280	4734	5187	5641	7
8	226	680	1134	1587	2041	2494	2948	3401	3855	4309	4762	5216	5669	8
9	255	708	1162	1615	2069	2523	2976	3430	3883	4337	4791	5244	5698	9
10	283	737	1190	1644	2097	2551	3005	3458	3912	4365	4819	5273	5726	10
11	311	765	1219	1672	2126	2579	3033	3487	3940	4394	4847	5301	5755	11
12	340	793	1247	1701	2154	2608	3061	3515	3968	4422	4876	5329	5783	12
13	368	822	1275	1729	2183	2636	3090	3543	3997	4450	4904	5358	5811	13
14	396	850	1303	1757	2211	2664	3118	3572	4025	4479	4932	5386	5840	14
15	425	878	1331	1786	2239	2693	3146	3600	4053	4507	4961	5414	5868	15

Fig. 270.— To change grams to pounds find number on the chart. At top of column read the pounds; at either end, the ounces. To change pounds to grams, find pound column, run eye down to proper ounce line, read figure there.

GLOSSARY

[The American Illustrated Medical Dictionary has been largely used in the preparation of this glossary. The numbers at the end of the definition indicate the page in the text describing the subject.]

A.

Abactus venter (ab-ak'tus ven'-ter) [L.]. Induced abortion.

Abdomen (ab-do'men). The belly; that portion of the body which lies between the thorax and the pelvis.

Abdominal (ab-dom'in-al). Pertaining to the abdomen. **A. delivery**, delivery of the child through an incision in the abdomen; *Cesarean section*. **A. gestation**, pregnancy occurring outside of the uterus in the free abdominal cavity. **A. pregnancy**, same as *Abdominal gestation*. **A. section**, cutting through the abdominal wall into the abdominal cavity; *Cesarean section*; *celiotomy*; *laparotomy*.

Ablactation (ab-lak-ta'shun). The weaning of a child; cessation of the secretion of milk. p. 441.

Abnormal (ab-nor'mal). Unnatural; contrary to the usual structure or condition.

Abortifacient (ab-or-tif-a'shent) 1. Causing abortion. 2. A drug capable of producing abortion or miscarriage.

Abortion (ab-or'shun). The expulsion of the fetus during the first twenty-eight weeks of pregnancy, or before it is viable. p. 357.

Abrasion (ab-ra'zhun). A rubbing off of a portion of skin or mucous membrane. A spot from which the skin or mucous membrane has been rubbed.

Abrup'tio placen'tae (ab-rup't' she-o pla-zen'tee). Premature detachment of the normally implanted placenta. Accidental hemorrhage. p. 362.

Abscess (ab'ses). A collection of pus in a cavity.

Absorbent (ab-sor'bent). 1. Taking up by suction. 2. A dressing or medicine which takes up moisture.

Accouchement (ah - koosh-maw') [Fr.]. Delivery; the act of being delivered. **A. forcé** (for-sa'), rapid artificial delivery.

Accoucheur (ah - koosh - er') [Fr.]. An obstetrician.

Accoucheuse (ah - koosh - ez') [Fr.]. A midwife.

Acid (as'id). 1. Sour; having properties opposed to those of the alkalis. 2. A chemical compound which has the power of uniting with an alkali to form a new compound called a salt. **A. reaction**, the turning of litmus-paper red; a test for the presence of acids.

Acinus (as'in-us), pl., *a'cini*. 1. Any one of the smallest lobules of a compound gland, like the liver. 2. One of the small air-sacs of the lungs.

Acme (ak'me). The crisis or critical stage of a disease.

Acne (ak'nee). A tiny skin pustule resulting from infection of retained secretion of a skin sebaceous gland.

Acrid (ak'rid). Pungent; irritating.

Acute (ak - ūt'). 1. Sharp-pointed. 2. Severe. The term is applied to diseases which have severe symptoms, but are of short duration.

Adnexa (ad-neks'ah) [L. pl.]. Appendages or adjunct parts; especially those of the uterus—the ovaries and tubes. **Uterine a.**, the ovaries and fallopian tubes. Fig. 15.

After-birth (af'ter - berth). The placenta, with the membranes and umbilical cord. p. 77.

After-care (af'ter-kār). The care or nursing of convalescents.

After-pains (af'ter - pānz). Pains due to the contraction of the uterus after the placenta has been expelled. pp. 77, 408.

Agalactia (ah-gal-ak'she-ah). Absence of the milk secretion. p. 436.

Albolene (al'bo-lēn). An oily white substance made from petroleum. The solid resembles vaselin, and is used in making ointments. The liquid is used for spraying the nose and throat.

Albuminuria (al-bu-min-u're-ah). The presence of albumin in the urine. pp. 106, 340.

Alimentation (al-im-en-ta'shun). The act of taking nourishment.

Alkaline (al'kal-in). Having the properties of an alkali. **A. reaction**, the turning of litmus-paper blue.

Alvine (al'vin). Pertaining to the stomach or bowels. **A. dejections**, the feces.

Amenorrhea (am-en-or-re'ah). Absence of the menstrual flow.

Amnii, liquor (am'ne-i li'kwor). The water surrounding the fetus in the uterus. p. 51.

Amnion (am'ne - on). The most internal membrane containing the waters which surround the fetus in the uterus. p. 51.

Amniotic (am-ne-ot'ik). Pertaining to the amnion. **A. sac**,

the membranes surrounding the fetus in the uterus.

Anasarca (an - a - sark'ah). Dropsy. Fluid in the tissues. Edema.

Anemia (an-e'me-ah). 1. Deficiency in the quantity or quality of the blood: it may be general or local. 2. Deficiency in the number of red blood-corpuscles.

Anemic (an - em'ik). Having anemia.

Anemoscope (a-nem'o-scōp). 1. An instrument to indicate the direction of air-currents. 2. The little wheel in the outlet flue of an incubator. p. 490.

Anencephalus (an-en-sef'alus). A single monster born without cranium or brain.

Anesthesia (an-es-the'zhe-ah). Loss of feeling or perception; it may be general or local.

Anesthetic (an-es-thet'ik). 1. Having no perception or sense of touch. 2. A drug capable of producing anesthesia. p. 187.

Anesthetist (an - es'thet - ist). A person skilled in administering anesthetics.

Ankyloglossia (ang-kil-o-glos'-e ah). Tongue-tie. p. 476.

Ankylosis (ang - kil - o' sis). Stiffening of joints. A joint which has become immovable.

Annular (an'u-lar). In the form of a ring.

Anorexia (an - o - reks' e - ah). Loss of appetite for food.

Anteflexion (an-te-flek'shun). A bending forward, as of the uterus.

Ante partum (an-te par'tum) [L.]. Before the birth of a child.

Anterior (an-te're-or). Situated in front of.

Anthelmintic (an-thel-min'tik). 1. Destroying worms. 2. A remedy for intestinal worms.

Antiseptic (an - te - sep'tik). Preventing sepsis, pus formation, or putrefaction. Among the best common antiseptics are alcohol, creosote, carbolic acid, corrosive

sublimate (bichlorid of mercury), chlorin, charcoal, boric acid, tannic acid, lysol. **A. dressing**, a surgical dressing containing an antiseptic. **A. surgery**, surgery with proper use of antiseptics.

Anus (a'nus) [L.]. The external opening of the rectum. pp. 36, 38.

Apathetic (ap - a - thet'ik). Without emotion. Indifferent to surroundings.

Aphthae (af' thē). Small whitish erosions on the mucous membrane of the mouth. See *Bednar's a.*, p. 448.

Areola (ar-e-o'lah). The pigmented ring around the nipple. **Secondary a.**, a slightly pigmented ring just outside the areola, sometimes observed after the fifth month of pregnancy. p. 40.

Argyrol (ar'jir-ol). A drug; a preparation of silver.

Arterial (ar-te're-al). Pertaining to an artery. **A. blood**, the bright red blood in the arteries, which has been aerated, or charged with oxygen in the lungs. **A. hemorrhage**, hemorrhage from an artery.

Artery (ar'ter-e). One of the vessels carrying blood from the heart; so called because the ancients thought they contained air.

Articular (ar'tik'-u-lar). Pertaining to a joint.

Articulation (ar-tik-u-la'shun). A joint; the junction of two bones.

Ascites (as - si'tēz). An accumulation of serous fluid in the free abdominal cavity. *Dropsy* of the abdomen.

Asepsis (ah-sep'sis). Without sepsis; freedom from infection; surgical cleanliness.

Aseptic (ah-sep'tik). In a surgically clean manner.

Asphyxia (as-fix'e-ah). Suspended animation; interrupted respiration; that state in which

there is complete suspension of the powers of mind and body. **A. neonato'rum**, asphyxia of the newborn. p. 479.

Aspirating needle (as-pir-a'ting ne'dl). A hollow needle attached to a suction syringe: used for withdrawing fluids from the body.

Assimilate (as-sim'i-late). To convert food into chyle and blood; to change food into a substance like the living body.

Astringent (as-trin'jent). Having the power to diminish excessive discharges.

Atelectasis (at-el-ek'tas-is). 1. Imperfect expansion of the lungs at birth. 2. Partial collapse of the lungs. p. 452.

Atony (at'on-e). Lack of normal tone or strength.

Atrophic (at-rof'ik). Not properly nourished; showing atrophy.

Atrophied (at'ro-fēd). Wasted; having atrophy.

Atrophy (at'ro-fe). Wasting or emaciation with loss of strength, but without fever.

Autoclave (aw'to-klāv). A high-pressure steam sterilizer.

Auto-infection. Infection from germs living in the vagina not introduced from without. p. 391.

Autotransfusion (aw''to-trans-fu'-zhun). The forcing of blood into the vital parts of the body by bandaging or elevating the limbs.

A v i c e n n a (av-i-sen'ah). Mohammedan physician. Born, 980; died, 1037.

A x i l l a (aks-il'ah). The arm-pit.

Axis - traction (aks''is-trak'shun). Pulling or drawing on the head of the child during delivery in the directions normally followed by the head during birth—*i. e.*, in the axis of the pelvis. **A. forceps**, obstetric forceps with an attachment for producing axis-traction. p. 274.

B.

Bacteria (bak-te're-ah) [L.]. Plural of *Bacterium*. Vegetable microorganism.

Bag of waters. The membranes enclosing the liquor amnii and the fetus. Sometimes applied to that portion of the membranes which protrude into the os. pp. 70, 73.

Ballottement (bal-ōt-maw'). The diagnosis of pregnancy by pushing up the uterus by a finger inserted into the vagina, so as to cause the fetus to rise and fall again like a heavy body in water.

Barnes' bags (barnz). Rubber bags used to dilate the cervix uteri. p. 320.

Basiotribe (ba'se-o-trib). An instrument for crushing the base of the fetal skull.

Basiotripsy (ba'se-o-trip-se). Crushing the fetal skull with a basiotribe.

Baudelocque (bo - dlok'). A famous French obstetrician. Born, 1746; died, 1810. **B.'s diameter**, the external conjugate diameter of the pelvis, measured from the last lumbar spine behind to the top of the pubic bone in front. p. 553.

Bednar's aphthae (bed-narz' af'-thē). Shallow ulcers in the back part of the mouth of the newborn. They are caused by badly shaped rubber nipples, or by force in cleansing the mouth. p. 448.

Beri-beri (ber're-ber're). A food deficiency disease, marked by wasting, paralysis, and anæsthesia, with or without edema.

Bimanual (bi-man'u-al). Performed with both hands. **B. palpation**, examination of the pelvic organs of a woman with one hand on the abdomen and two fingers of the other hand in the vagina.

Binder (bīn'der). A broad band passed tightly around the

abdomen after childbirth. pp. 124, 221.

Birth (berth). 1. The delivery of a child. 2. That which is born. **B.- mark**, "mother's mark"; "maternal mark." A blemish on the skin found at birth. p. 103.

Bistoury (bis'too-re). A small knife for surgical purposes.

Blennorrhæa (blen-or-e'ah). An excessive secretion of the mucous glands of any mucous membrane.

Borborygmus (bor-bo-rig'mus), pl., *borborygmi* [L.]. A rumbling noise made by gases in the bowels.

Bougie (boo-zhē') [Fr.]. A slender instrument for introduction into the urethra, esophagus, uterus, vagina, or rectum.

Breast-pump (brest-pump). An instrument for drawing the milk out of the breast.

Breech (brēch). The buttocks. **B. delivery**, labor in which the breech presents and is delivered first. p. 248.

Brim (brim). The upper edge of the pelvis; the inlet, or superior strait. Figs. 1, 5, 9.

C.

Calorie (kal'o - re). The amount of heat which the combustion of a given material will develop in raising one kilogram of water from 0° to 1° C. p. 525.

Capillary (kap'il-a-re). 1. Resembling hair in size. 2. One of the minute blood-vessels which form a network between the minute arteries and veins.

Caput (ka'put), pl., *cap'ita* [L.]. The head, including the skull and face. **C. incuniatum**, impaction of the fetal head during labor. **C. succedaneum**, a dropsical swelling on the presenting part of the head during labor, due to lack of pressure on that part. p. 474.

Carbohydrate (kar - bo - hi' drāt). One of a group of chemical compounds of which sugar, starches, and gums are the most important.

Carbon dioxid (kar'bon di-ox'id). Carbonic acid gas.

Caries (ka're-ēz). Decay of the bones or teeth.

Carminative (kar-min'ah-tiv). 1. Relieving flatulence. 2. A medicine which relieves flatulence and assuages pain. The chief carminatives are anise, caraway, cardamom, cajuput, chalk, cinnamon, cloves, and coriander. p. 410.

Cartilage (kar'til-ej). Gristle; a pearly white, glistening substance formed at the articular surfaces of bones, **Ensiform c.**, the cartilage at the lower extremity of the breast-bone.

Casein (ka'se-in). The principal protein of milk and the basis of cheese.

Caseo'sa, Ver'nix. The greasy, whitish substance which covers the skin of the fetus. p. 87.

Cast (kast). A model of a hollow organ, especially one of the tubules of the kidney, and found in the urine.

Cataclysm (kat'ak-lizm). An overwhelming flood, or convulsion, catastrophe.

Cathartic (kath-ar'tik). 1. Purgative or purging. 2. A drug that increases evacuation from the bowels.

Catheter (kath'ct-er). A slender tubular instrument for withdrawing fluids from a cavity of the body or for distending a passage. **Tracheal c.**, a woven catheter used for aspirating foreign substances from the windpipe of the child, and for blowing air into the lungs. p. 480.

Caul (kawl). A portion of the amniotic membrane which sometimes covers the child's head at birth.

Celiotomy (se-le-ot'o-me). Abdominal section; laparotomy; opening the abdomen.

Cell (sel). 1. Any one of the minute masses of protoplasm of which organized tissue is composed. 2. One of the chambers holding the fluids of a galvanic battery. 3. A small, partly closed space, as an air-cell.

Cellulitis (sel-u-li'tis). Inflammation of cellular tissue; especially purulent inflammation of the loose subcutaneous tissue.

Cephalhematoma (sef'al-he-mat-o'mah). A blood-tumor occurring on the head of the newborn infant. p. 474.

Cephalic (sef-al'ik). Pertaining to the head. **C. pole**, the head of the fetus. **C. presentation**, the presentation of any part of the head of the fetus in delivery. p. 246.

Cephalotomy (sef-al-ot'o-me). The operation of cutting or breaking down the fetal head; craniotomy.

Cephalotribe (sef'al-o-trib). An instrument for crushing the fetal head.

Cephalotripsy (sef'al-o-trip-se). The operation of crushing the fetal skull with the cephalotribe. See *Craniotomy*.

Cerebrospinal (ser'e-bro-spi'nal). Relating to the brain and spinal cord. **C. fluid**, the clear fluid in the ventricles of the brain and in the central canal of the spinal cord.

Cervix (ser'viks) [L.]. The neck or any neck-like part, especially the back part. **C. u'teri**, the neck or narrow lower end of the uterus.

Cesarean section (se-za're-an). The operation of cutting through the abdominal walls and through the walls of the uterus, and delivering the child through these incisions. p. 286.

Chafe (chāf). 1. To fret and wear by rubbing. 2. The red-

dened, irritated skin in the folds of fat babies. p. 232.

Chloasma (klo-az'mah). An affection of the skin in which there are patches with a yellowish or brownish discoloration. **C. grvida'rum**, chloasma which occurs during pregnancy. **C. uteri'num**, the mask of pregnancy or which appears in some uterine diseases. p. 65, also Fig. 94.

Chorea (ko-re'ah). St. Vitus' dance; a nervous disease in which there are convulsive movements.

Chorion (ko're-on). The more external of the fetal membranes.

Chromicized catgut (kro-mis-izd kat'gut). Catgut treated with chromic acid. It is used for sutures and ligatures.

Chronic (kron'ik). Long continued; the opposite of acute.

Cicatricial (sik-at-rish'al). Relating to cicatrix or scar.

Cicatrix (sik-a'triks or sik'at-riks), pl., *cica'trices* [L., "scar"]. A scar. The mark left by a sore or wound.

Cilia (sil'e-ah). The eyelashes. The mucous membrane of the tubes and uterus are covered with cells having hairlike processes called cilia.

Circulatory (sir'ku-la-to-re). Relating to the circulation. **C. system**, the heart, arteries, veins, and capillaries, taken as a whole.

Circumcision (ser-kum-sizh'un). The removal of all or a part of the foreskin or prepuce. p. 454.

Cleft palate (kleft pal-at). A congenital split in the roof of the mouth, so that the nose and mouth form one cavity. p. 475.

Climacteric (kli-mak-ter'ik). The cessation of menstruation in women.

Clitoris (klit'o-ris). A small, elongated, erectile body, situated at the anterior part of the vulva.

Clonic spasms (klon-ik). Spasms in which the contractions

and relaxations alternate, as in eclampsia.

Clyster (klis'ter). An enema.

Coagulated (ko-ag'u-lāt-ed). Clotted.

Coaptation (ko-ap-ta'shun). The fitting together of displaced parts, as the ends of a fractured bone.

Collapse (kol-laps'). 1. To fall in. 2. Extreme depression or complete prostration of the vital powers, with failure of circulation.

Collyrium (kol-ir'e-um). An eye-wash or salve for the eyes.

Colostrum (ko-los'trum) [L.]. The first fluid secreted by the mammary glands after delivery. It contains less casein and more albumin than the ordinary milk, as well as numerous fatty globules. **C. corpuscles**, the granular cells found in colostrum. p. 81.

Colpeurynter (kol'pu-rin-ter). A dilatable bag used to distend the vagina. p. 320.

Colpeuryasis (kol - pu ' ris - is). Dilatation of the vagina by means of the colpeurynter.

Coma (ko'mah) [L.]. Profound stupor or drowsiness occurring in the course of certain diseases, as eclampsia, or after severe injury.

Comatose (ko'mat-ōs). Affected with coma.

Comedo (kom-e'do), pl., *comedo'nes*. "Black-heads." The dried plugs of sebaceous matter sometimes found in the pores of the skin. In the newborn they are white.

Conception (kon-sep'shun). The impregnation of the ovum by the spermatozoid. The beginning of pregnancy. p. 48.

Condyl's fluid (kon'dēz). An antiseptic preparation of permanganate of potash.

Congenital (kon - jen ' it - al). Existing at or before birth.

Congestion (kon-jest'yun). Excessive accumulation of blood in a part.

Conjugata vera (kon-ju-gā'ta ve'ra) [L.]. The internal pelvic diameter measured from the promontory or prominent part of the sacrum to the upper margin of the pubic joint. p. 554.

Conjunctiva (kon-junk-ti'vah) [L.]. The mucous membrane which lines the eyelids and covers the eyeball.

Conjunctival (kon-junk'tiv-al). Relating to the conjunctiva.

Conjunctivitis (kon-junk-tiv-i'tis). Inflammation of the conjunctiva.

Contagion (kon-ta'jun). The communication of disease by contact, direct or indirect.

Contagious (kon-ta'jus). Transmissible by contact.

Contraindication (kon''tra-in-di-ka'shun). A condition that renders some particular line of treatment improper or undesirable.

Convalescence (kon - val - es'ens). The stage of recovery.

Convalescent (kon-val-es'ent). Regaining health after illness. **C. diet**, any simple, easily digested food suitable for a convalescent patient.

Convulsion (kon-vul'shun). A spasm; a series of violent involuntary contractions of a muscle or set of muscles.

Coprostasis (kop-ros'tas-is). Costiveness; constipation; undue retention of feces in the bowels.

Cornea (kor ' ne - ah). The transparent, convex, and nearly circular anterior portion of the eyeball.

Coronal (kor'o-nal). Relating to the crown of the head. **C. or coronary suture**, the suture formed by the junction of the frontal with the parietal bones.

Coryza (ko-ri'zah). Cold in the head; an acute catarrh of the nasal mucous membrane.

Couveuse (koo-vez') [Fr.]. An incubator. p. 488.

Cranioclasia (kra-ne-ok'las-is). The crushing of the fetal skull. See *Craniotomy*. p. 285.

Cranioclast (kra'ne-o-klast). An instrument for crushing the fetal skull. p. 284.

Craniotomy (kra-ne-ot'-o-me). The operation of cutting or breaking down the fetal head.

C. scissors, an S-shaped scissors for performing craniotomy. p. 284.

Credè's method for preventing ophthalmia (kra-dāz'). The application of a drop of 2 per cent. silver nitrate solution to the eye of the newborn, followed by normal salt solution. **C's method of expelling placenta**, a method of expelling the placenta. The operator grasps the fundus of the uterus (through the abdominal wall) and with moderate pressure squeezes out the placenta, "as the seed of a ripe cherry compressed between the fingers."

Crenasol (kren'as-ol). A disinfectant.

Crotchet (krot'chet). A curved, hook-line instrument for extracting the fetus after craniotomy; it is no longer used.

Curd (kurd). The coagulum of milk. It is mostly casein.

Curet (ku-ret') [Fr.]. A kind of scraper or spoon for removing growths or other materials from the walls of cavities.

Curetage (ku-ret-azh'). Treatment by the curet. p. 312.

Curetment (ku-ret'ment). Same as *Curetage*. p. 312.

Cutaneous (ku-ta'ne-us). Pertaining to the skin.

Cutis (ku'tis). 1. The skin. 2. The true skin, or cutis vera.

Cyanosis (si-an-o'sis). Blueness of the skin caused by deficient amount of oxygen in the blood. p. 452.

Cyanotic (si-an-ot'ik). Affected with cyanosis.

Cystitis (sis-ti'tis). Inflammation of the bladder. p. 413.

Cystoscope (sis'to-skōp). An instrument for examining the interior of the bladder.

D.

Debility (de-bil'it-e). Weakness; loss of power.

Decapitation (de-kap-it-a'shun). The removal of the head of the fetus in embryotomy. p. 284.

Decidua (de-sid'u-ah). The membranous structure produced during pregnancy and thrown off after parturition. It is composed of the greatly changed mucous membrane of the uterus.

D. reflex'a, that portion of the decidua which is reflected over the ovum, surrounding it. **D. serot'ina**, that part of the decidua which lies under the maternal portion of the placenta. **D. ve'ra**, that portion of the decidua which lines the uterus.

Decomposition (de'kom'pozish'-un). 1. The separation of compound substances in their constituent parts. 2. Putrefaction or decay.

Decubitus (de-ku'bit-us). 1. The act of lying down. 2. A bed-sore. p. 344.

Defecation (def-ek-a'shun). Evacuation of the bowels.

Dehydrated (de-hi'dra-ted). Deprived of water. Poor in fluids.

Delirium (de-lir'e-um). Derangement of the mind, characterized by wandering speech, wakefulness, and excitement.

Delivery (de-liv'er-e). 1. The expulsion or extraction of the child at birth. 2. Removal of a part from the body—*e.g.*, the placenta.

Denudation (den-u-da'shun). 1. The act of laying bare. 2. The removal of the epithelium.

Denuded (de-nu'ded). Laid bare.

Desquamation (des-kwa-ma'shun). The peeling off of skin in flakes.

Detritus (de-tri'tus). Broken-down material, waste.

Diagnosis (di-ag-no'sis). The art or science of distinguishing one disease from another by means of signs and symptoms.

Diagnostic (di-ag-nos'tik). Distinctive; indicating the nature of a disease; furnishing a diagnosis.

Diaphoresis (di''af-o-re'sis). Perspiration, especially profuse perspiration.

Diaphoretic (di''af-o-re'tik). 1. Causing diaphoresis. 2. A drug that causes sweating.

Diaphragm (di'af-ram). The musculomembranous partition between the chest and abdomen, and the most important muscle of respiration.

Diastolic (dy'as-to'lic). During the diastole or relaxation of the heart.

Diathesis (di-ath'es-is). Natural predisposition to a certain disease.

Diet (di'et). 1. Victuals; habitual food.

Dietary (di'et-a-re). A regular or systematic scheme of diet.

Dietetic (di-et-et'ik). Pertaining to diet. **D. treatment**, treatment of disease by means of a regulation of diet.

Differential (dif-fer-en'shal). Discriminating; showing a difference. **D. diagnosis**, discriminating between two diseases which present a similar group of symptoms.

Dilute (di-lewt'). 1. To make thin. 2. To diminish the strength, flavor, or color of. 3. To become thin or attenuated.

Disintegration (dis-in-te-gra'shun). Decay. The separation of a substance into its component parts.

Diuresis (di-u-re'sis). Increased secretion of urine.

Diuretic (di-u-ret'ik). 1. Producing diuresis. 2. A drug that causes increased flow of urine.

Douche (doosh). A stream of water directed against a part or into a cavity. p. 311.

Dropsy (drop'se). The abnormal accumulation of serous fluid in the tissues or cavities of the body.

Duct (dukt). A passage with well-defined walls; especially, a tube for the passage of a secretion or fluid.

Ductus (duk'tus). A duct. **D. arterio'sus**, a blood-vessel in the fetus communicating directly between the pulmonary artery and the aorta. **D. veno'sus**, a blood-vessel in the fetus communicating directly between the umbilical vein and the descending vena cava.

Duodenum (du-o-de'num). That part of the small intestine next to the stomach.

Dysmenorrhea (dis''men-or-e'ah). Painful or difficult menstruation.

Dyspnea (disp-ne'ah). Difficult or labored breathing.

Dystocia, **Dystokia** (dis-to'se-ah, dis-to'ke-ah). Painful, slow, or difficult labor. **Fetal d.**, dystocia due to malposition or malformation of the fetus.

Maternal d., dystocia due to some deformity on the part of the mother. **Placental d.**, difficulty in removing the placenta.

E.

Ecchymosis (ek-im-o'sis). An extravasation of blood under the skin or mucous membrane.

Eclampsia (ek-lamp'se-ah). A sudden attack of convulsions occurring during pregnancy, labor, or just after labor. p. 345.

Ectopic (ek-top'ik). Out of the normal place. **E. gestation**,

pregnancy in which the fetus is not in the uterus. See *Extra-uterine pregnancy*. **E. pregnancy**, same as *Ectopic gestation*. **E. sac**, the amniotic sac and its coverings in ectopic gestation. p. 364.

Eczema (ek'ze-mah). A non-contagious skin disease whose prominent manifestations are the formation of small vesicles closely crowded together, and an intolerable itching and burning of the affected part. **E. intertri'go**, an eczematous condition in the folds of fat babies; chafe. p. 460.

Eczematous (ek-zem'at-us). Affected with eczema.

E. G. Abbreviation for *exemplum gratia*, for example.

Eliminate (e-lim'in-āt). To expel; to throw off waste matter.

Elimination (e-lim-in-a'shun). The act of throwing off waste matter.

Emaciation (e-ma-she-a'shun). A wasted condition of the body. Loss of flesh.

Embolism (em'bol-izm). The plugging of a blood-vessel by a clot or other obstruction which has been carried to this place by the blood current. **Air e.**, passage of air in injurious quantities to the heart and circulation. p. 175.

Embolus (em'bo-lus). A clot or other obstruction of a blood-vessel which has been carried from a distant vessel and lodged in a smaller one, obstructing the circulation.

Embryo (em'bre-o). The fetus before the end of the third month of development.

Embryotomy (em-bre-ot'o-me). The destruction of the fetus in the uterus. p. 285.

Emetic (e-met'ik). 1. Causing vomiting. 2. A drug which causes vomiting.

Emmenagogue (em-en'ag-og). 1. A drug having the power to stimulate the menstrual flow. 2.

Aiding the function of menstruation.

Emprosthotonos (em-pros-thot'o-nos). Spasm causing the body to bend forward.

Emulsion (e-mul'shun). A milk-like mixture prepared by uniting oil and water by means of another substance, usually a mueilage.

Emunctory (e-munk'to-re). 1. Excretory. 2. An excretory duct or organ.

Enema (en'e-mah). A medicine or fluid injected into the rectum, either to procure an evacuation or for nourishment.

Enervation (en-er-va'shun). Languor; weakness; lack of nervous energy.

Engagement (en-gāj'ment). The entrance of the fetal head into the superior strait of the pelvis.

Ensiform (en'sif-orm). Sword shaped. **E. appen'dix**, **E. car'tilage**, **E. proc'ess**, the lower extremity of the breast-bone.

Enteritis (en-ter-i'tis). Inflammation of the small intestine.

Epidemic (ep-id-em'ik). 1. A disease which is widely prevalent. 2. The season of prevalence of an epidemic disease.

Epigastralgia (ep'e-gas-tral'je-ah). Pain in the pit of the stomach.

Epilepsy (ep'il-ep-se). The falling sickness; a ehronic nervous disease characterized by convulsions or fits, and in which there is loss of consciousness.

Epileptic (ep-e-lep'tik). 1. Pertaining to epilepsy. 2. A person affected with epilepsy.

Epileptiform (ep - e - lep ' te - form). Resembling epilepsy. See *Eclampsia*.

Episiotomy (ep-iz-e-ot'o-me). An incision of the vulvar orifice to permit the fetus to pass. p. 75.

Epithelium (ep-ith-c'leum). Cuticle, the covering of the true skin and mueous membrane.

Ergot (er'got). A drug having the power to stimulate uterine contraction. It is used to check hemorrhage after labor, and to arrest hemorrhages from any organ; to relieve congestion of the brain and spinal cord. Dose, 15-60 minims (1-4 c.c.).

Ergotin (er'go-tin). The active principle of ergot. Dose, $\frac{1}{16}$ - $\frac{1}{2}$ grain (0.0042-0.033 gm.).

Erosion (e-ro'zhun). An eating or gnawing away; a kind of ulceration.

Erysipelas (er-is-ip'el-as). An acute contagious disease caused by a germ, *Streptococcus erysipel'atis*, and characterized by chill, high fever, and intense loeal redness and swelling of the skin and mucous membrane.

Erythema (er-ith-e'mah). A reddening of the skin which disappears when the skin is pressed. p. 459.

Esophagus (e-sof'ag-us). The gullet.

Eustachian tube (u-sta'ke-an tūb). The canal extending from the pharynx to the middle ear, or tympanum. **E. valve**, a semilunar valve in the heart at the opening of the inferior vena cava.

Eutocia, **Eutokia** (u-to'she-ah, u-to'ke-ah). Normal labor.

Evacuation (e-vak-u-a'shun). 1. The act of moving the bowels. 2. The discharge from the bowels.

Evisceration (e-vis-er-a'shun). Removal of the bowels or viscera from the body. **Obstetric e.**, removal of viscera of the fetus in embryotomy.

Exacerbation (egs-as-er-ba'shun). 1. Increase in severity of the symptoms of a disease. 2. The stage of periodic increase in the severity of symptoms.

Excoriation (ex-ko-re-a'shun). A superficial loss of substance. p. 458.

Excrement (ex ' kre - ment). Feces. That which is excreted by the bowels.

Excrete (ex-krēt). To throw off, as waste matter, by a normal discharge.

Excretion (ex - kre ' shun). 1. The process of excreting. 2. The material which has been excreted.

Exostosis (ex - os - to ' sis). A bony growth on the surface of a bone or tooth.

Expiration (ex - pi - ra ' shun). The act of expelling air from the lungs.

Expiratory (ex-pīr'a-to-re). Pertaining to expiration.

Expire (ex-pīr'). 1. To expel the breath. 2. To die.

Expulsive (ex-pul'siv). Driving or forcing out. **E. pains**, those occurring during the second stage of labor. **E. stage**, the second stage of labor. p. 160.

Exsanguination (ex-sang-gwin-a'shun). The condition of being without blood. p. 385.

Extension (ex - ten ' shun). A term applied to that stage in the delivery of the fetal head when the chin is no longer flexed on the chest. The opposite of flexion.

Externalia (ex-ter-na'le-ah). The external genital organs.

Extra-uterine (ex-trah-u'ter-in). Outside the uterus. **E. life**, life after birth. **E. pregnancy**, pregnancy in which the fetus is not contained in the uterus, but in some organ outside the uterus. Ectopic gestation. p. 363.

Extravasation (ex-trav-as-a'shun). The escape of a fluid from its normal vessel or cavity into the surrounding tissues.

Exudation (egs-u-da'shun). Oozing; slow escape of liquid.

F.

Facial (fa'shal). Pertaining to the face. p. 471.

Faeces (fe'sez). See *Feces*.

Fallopian (fal-lo'pe-an) **pregnancy**. Pregnancy occurring in the fallopian tubes; same as

tubal pregnancy. **F. tubes**, the oviducts: two canals leading from the ovaries to the body of the uterus. Fig. 15.

Farinaceous (far-in-a'shus). Containing flour: said of certain diets.

Fauces (faw'ses). The back part of the mouth leading into the pharynx.

Febrile (feb'ril). Pertaining to fever. Feverish.

Fecal (fe'kal). Pertaining to feces; containing feces.

Feces (fe'sēz). The excrement of undigested residue of the food discharged from the bowels.

Fecundation (fe-kun-da'shun). The fertilization of the ovum by means of the spermatozoid. p. 48.

Fenestrated (fen'es-tra-ted). Having openings, or fenestra.

Fetus (fe'tus) [L.]. The child *in utero* from the end of the third month of development till birth.

Fillet (fil'let). A loop of tape used for making traction.

Finger cot (fing'ger kot). A thin rubber covering for the finger. Occasionally used as a dressing for a wound of the finger.

Fissure (fish'ūr). A crack or narrow opening. p. 425.

Flex (flex). To bend, as a joint.

Flexion (flex'shun). 1. The act of bending. 2. The state or condition of being bent. **F. stage**, that stage in labor in which the chin of the fetus is pressed against its breast.

Flocculus (flok'u-lus), pl., *floc'culi* [L.]. A small shred or flake, usually floating in a liquid.

Fontanel, Fontanelle (fon-tan-el'). The quadrangular space at the junction of the frontal with the two parietal bones in infants. "The soft spot." The other junctions of the cranial bones are also called fontanels. p. 56.

Foramen (for-a'men), pl., *foram'-ina* [L.]. A hole or opening, especially through bone. **F. ova'le**, an opening in the partition between the auricles of the heart in the fetus.

Forceps (for'seps). A two-bladed instrument for grasping and holding that to which it is applied. **Obstetric f.**, the instrument used to extract the child's head. p. 271.

Formaldehyd (for-mal'de-hīd). 1. A powerful disinfectant gas. 2. An aqueous solution of the gas is used as a surgical antiseptic and preservative for specimens. p. 575.

Formula (for-mu-lah). 1. A prescribed method for preparing a medicine. 2. A combination of symbols used to express the chemical constitution of a substance.

Fornix (for'niks). Arch or vault. **F. of the vagina**, the hollow places between the cervix and the anterior, posterior, and lateral walls of the vagina.

Fourchet (foor-shet') [Fr.]. The fold of mucous membrane at the posterior junction of the labia majora.

Friable (fri'ab-l). Easily pulverized.

Function (funk'shun). The special office of an organ.

Fundus (fun'dus) [L.]. The base or part of a hollow organ remotest from its mouth. **F. u'teri**, the part of the uterus which is most remote from the cervix or os.

Funis (fu'nis). The umbilical cord.

Furunculus (fu-rung'ku-lus). A boil.

G.

Galactagogue (gal-ak'tag-og). 1. Increasing the secretion of milk. 2. A drug having the power to increase the flow of milk. p. 437.

Galactorrhea (gal-ak-tor-rhe'ah). Excessive secretion of milk. p. 435.

Galactostasis. Cessation or stagnation of the milk secretion.

Gastric (gas'trik). Pertaining to the stomach.

Gavage (gah-vazh') [Fr.]. 1. Feeding by the stomach-tube. 2. The employment of a very full diet. p. 501.

Genital (jen'it-al). Pertaining to generation, or to the organs of generation. p. 36.

Genupectoral (je-nu-pek'tor-al). Relating to the knees and chest. **G. position**, "knee-chest position." That posture in which the patient rests on the knees and chest, the thighs extending upward, the buttocks being as high as possible. p. 340.

Germicidal (jer-mis-i'dal). Destructive to germs.

Germicide (jer'mis-īd). An agent having the power to destroy germs.

Gestation (jes-ta'shun). Pregnancy. p. 62.

Gland (gland). An organ which separates a fluid from the blood.

Glandular (gland'u-lar). 1. Having the nature of a gland. 2. Furnished with glands.

Glans (glanz), pl., *glan'des*. Latin for *Gland*. The distal end or head of the penis or clitoris. p. 37.

Graafian follicle (grah'fe-an fol'-lik-l). Small spherical bodies in the ovary, each containing an ovum.

Granulation (gran-u-la'shun). The formation in wounds of small, rounded, fleshy masses; also a mass so formed.

Gravid uterus (grav'id u'ter-us). Pregnant uterus.

Gravida (grav'id-ah) [L.]. A pregnant woman.

Gravidity (grav-id'it-e). Pregnancy.

Gum, red (gum). Strophulus, a reddish eruption on the skin of the newborn. **White g.**, strophulus albus; a whitish eruption on the skin of the newborn. p. 459.

Gynecic (jin-e'sik). Relating to women.

Gynecologist (jin-e-kol'o-jist). One who is skilled in gynecology.

Gynecology (jin-e-kol'o-je). That branch of medicine which treats of women's constitution and diseases.

H.

Harelip (hār'lip). A congenital slit in the upper lip, sometimes double. p. 475.

Hebosteotomy. Section of the bone at the side of the pubic symphysis—pubiotomy.

Hematemesis (hem-at-em'es-is). The vomiting of blood.

Hematoma. An accumulation of blood in the tissues.

Hematosalpinx (hem''at-o-sal'-pinx). Distention of the fallopian tube with blood.

Hemorrhage (hem'or-rej). The escape of blood from its natural channels. Bleeding. p. 379.

Hemorrhoid (hem'or-roid). A pile; a vascular tumor of the mucous membrane of the rectum.

External h., appearing external to the anus. **Internal h.**, within the anus. p. 38.

Hernia (her'ne-ah) [L.]. The protrusion of an organ, or part of an organ, through an abnormal opening; rupture. p. 476.

Heterogeneous (het''er-o-je'ne-us). Of dissimilar nature.

HgCl₂. Chemical formula of bichlorid of mercury.

High forceps (hī for'seps). The application of the forceps to the fetal head as it enters the brim of the pelvis. p. 273.

Hirsute (her'sūt). Covered with hair. p. 36.

Homogeneous (ho-mo-je'ne-us). Of a similar nature.

Hormone (hor'mōn). The product of one of the glands of internal secretion; a ferment.

Hydragogue (hi'dra-gog). A drug having the power to increase the glandular secretions, and producing profuse watery discharges from the bowels.

Hydrometer (hi-drom'et-er). An instrument for measuring the specific gravity of fluids.

Hygiene (hi-jēn'). The science of health and its preservation.

Hygienic (hi-je-en'ik). Pertaining to hygiene or to health.

Hygrometer (hi-grom'et-er). An instrument for measuring the moisture of the atmosphere. p. 494.

Hymen (hi'men). The membranous fold which partly closes the entrance to the vagina, especially in the virgin.

Hyperemesis (hi-per-em'e-sis). Excessive vomiting. p. 338.

Hypersecretion (hi''per-se-kre'-shun). Excessive secretion.

Hypertrophy (hi-per'tro-fe). The unnatural overgrowth of an organ or part.

Hypodermatic, Hypodermic (hi''po-der-mat'ik, hi-po-der'mik). 1. Pertaining to the application of medicine under the skin. 2. A medicine introduced under the skin. **H. injection**, the injection of medicine or nutrient solutions under the skin. **H. needle**, the hollow needle of a hypodermic syringe. **H. syringe**, a small syringe for injecting fluid under the skin.

Hypodermoclysis (hi''po-der-mok'lis-is). Introduction into the subcutaneous tissue of fluids in large quantity. p. 313.

Hypogastric arteries (hi-po-gas'-trik). The umbilical arteries. They form part of the umbilical cord.

Hypophysis cerebri (hi-pof'e-sis ser-e-bri). A gland of internal

secretion located at the base of brain. Source of pituitrin.

Hypoplastic (hi'po-plas'tic). Undeveloped.

Hysteria (his-te're-ah). A nervous disease, mainly of young women, characterized by lack of control over acts and emotions.

Hysterotomy (his-ter-ot'o-me). Cesarean section. p. 286.

I.

Icterus neonatorum (ik'ter-us ne-o-na'tor-um). The jaundice sometimes seen in the newborn. pp. 87, 458.

Idiosyncrasy (id-e-o-sin'kra-se). A constitutional peculiarity, as of susceptibility or aversion.

I. e. Abbreviation for *id est*, that is.

Iliac (il'e-ak). Pertaining to the ilium or flank. **I. artery**, one of the two branches of the abdominal aorta. **I. fossa**, the broad, shallow cavity at the upper part of the inner surface of the ilium.

Ilium (il'e-um), pl., *il'ia* [L.]. The broad, flat, upper part of the innominate bone.

Impregnation (im - preg - na' shun). The act of making pregnant; fecundation. p. 48.

Impression, maternal (im-presh'-un, ma-ter'nal). The effect produced on the fetus *in utero* by the mental and other experiences of the mother during pregnancy. p. 103.

Inanition fever (in-an-ish'un fe'ver). A fever in infants, due to wasting of the body from lack of nourishment. p. 447.

Incise (in-siz'). To cut in or into, as with a knife.

Incised wound (in-sizd' woond). A wound made with a sharp knife.

Incision (in-sizh'un). A wound made by cutting; a cut.

Incontinentia paradoxa (in-kon-tin-en'she-ah par-ad-oks'ah). Filling of the bladder with urine, overflow and dribbling away of urine. pp. 83, 212.

Incubator (in'ku-ba-tor). An apparatus for rearing prematurely born children; couveuse. p. 488.

Indurated (in'du-ra-ted) Hardened; rendered hard.

Induration (in-du-ra'shun). An abnormally hard spot or place.

Infarct (in'farkt). A white or reddish hard lump in the placenta due to degeneration following interruption of blood-supply.

Infection (in-fek'shun). 1. The communication of disease from one person to another. 2. The agent by which a disease is conveyed. **Septic i.**, infection caused by pus-producing germs. p. 387.

Infectious (in-fek'shus). Liable to be communicated by infection.

Inflammation (in-flam-ma'shun). A diseased condition characterized by heat, pain, redness, and swelling, with or without fever.

Infusion (in-fu'zhun). 1. The steeping of a substance in water to obtain its medicinal properties. 2. The injection of a hot normal salt solution, 0.6 per cent, into a blood-vessel or subcutaneous tissue. **Arterial i.**, infusion into an artery. **Subcutaneous i.**, injection of the salt solution into the loose subcutaneous tissue. The usual locations are under the breast and over the shoulder-blades. **Venous i.**, infusion into a vein. Fig. 148.

Ingesta (in-jes'tah). Food taken into the stomach.

Ingestion (in-jest'shun). The act of taking food into the stomach.

Inhalation (in-hal-a'shun). 1. The drawing of air or other vapor into the lungs. 2. A substance to be inhaled as a vapor.

Inlet (in'let). The upper limit of the cavity of the pelvis. Fig. 5.

Innominate (in-nom'in-āt). Not having a name; nameless. **I. bone**, the hip-bone; it consists of the ilium, the ischium, and the os pubis.

Innominatum (in-nom-in-ā'tum). Nameless. The innominate bone. Fig. 4.

Insomnia (in-som'ne-ah). Inability to sleep; abnormal wakefulness. p. 417.

Inspiration (in-spi-ra'shun). The act of drawing air into the lungs.

Inspiratory (in-spir-a-to-re). Pertaining to inspiration. **I. muscles**, those muscles which, by their contraction, assist in inspiration.

Intertrigo (in-ter-tri'go). A chafing of the skin in moist situations, as about the anus and vulva, and in the armpits; chafe. p. 460.

Intestine (in-tes'tin). The bowel. The long membranous tube that extends from the stomach to the anus.

Introitus (in-tro-i-tus). The entrance to the vagina.

Inunction (in-unk'shun). The act of applying an ointment with friction.

In utero (in u'ter-o). Inside the uterus.

Inversion (in-ver'shun). Turning inside out or upside down. **I. of the uterus**, the turning inside out of the uterus. It may be due to pulling on the cord, a heavy placenta, or to the violent efforts of the patient.

Involution (in-vo-lu'shun). The return of the uterus to its normal size after labor. p. 78.

Irrigation (ir-ig-a'shun). 1. Washing by a stream of water or

other lotion. 2. The liquid used for irrigation.

Ischium (is'ke-um), pl., *is'chia* [L.]. The lower, posterior part of the innominate bone. It is separate from it in fetal life and infancy.

Ischuria (is-ku're-ah). Difficult urination. **I. paradox'a**, overflow of the full bladder. See *Incontinentia paradoxa*. pp. 83, 212.

J.

Jactitation (jak-tit-a'shun). The tossing and restlessness of a patient in acute disease.

Jaundice (jawn'dis) [L., *ic'terus*]. Yellowness of the skin, eyes, and secretions, due to the presence of bile-pigments in the blood. **Icterus**. pp. 87, 458.

Jejunum (ge-ju'num). A part of the small intestine next to the duodenum.

Jelly of Wharton (jel'e). The soft pulpy tissue of the umbilical cord.

K.

Kleptomania (klep-to-ma'ne-ah). A nervous affection characterized by a desire to steal.

Knee-chest position (nē-chest po-zish'un). That position in which the patient rests flat on the chest and knees, with the hips elevated as high as possible, and the thighs extending vertically; same as *genu-pectoral*. p. 340.

Kumiss (koo'mis). A nutritive food prepared originally from mare's milk, now from cow's milk.

Kyphosis (ki-fo'sis). Hump-backed curvature of the spine.

L.

Labia (la'be-ah) [L.]. The plural of *la'bium*. Lips, or parts resembling lips. **L. majo'ra**, the

folds of skin and fat which form each side of the vulva. **L. mino'ra**, the folds of mucous membrane inside the labia majora; the nymphae.

Labor (la'bor). Parturition. The expulsion of the fetus from the uterus. **Dry l.**, labor in which there is a lack of amniotic fluid. **Induced l.**, labor artificially brought on. **Missed l.**, retention of the dead fetus in the uterus beyond the normal period of pregnancy. **Precipitate l.**, labor of abnormally short duration. **Premature l.**, labor occurring before the normal time. **Spontaneous l.**, labor without artificial aid.

Laceration (las-er-a'shun). 1. The act of tearing. 2. A wound made by tearing; in obstetrics, referring to the perineum. pp. 177, 205.

Lactation (lak-ta'shun). 1. The secretion of milk. 2. The period of milk secretion. 3. The suckling of the infant. p. 82.

Lacteal (lak'te-al). 1. Pertaining to milk. 2. One of the intestinal lymphatics that take up chyle. **L. calculus**, a concretion of thickened milk in one of the milk-ducts. **L. swelling**, a swelling of the breast from an accumulation of milk.

Lactiferous (lak-tif'er-us). Producing or conveying milk. p. 39.

Lactometer (lak-tom'e-ter). An instrument for finding the specific gravity of milk.

Laity (la'i-ty). The people outside the profession.

Lambdoid, Lambdoidal (lam'doid, lam-doi'dal). Shaped like the Greek letter Δ or λ . **L. suture**, the suture between the occipital and the two parietal bones. p. 56.

Lanugo (lan-u'go) [L.]. 1. The fine hair on the body of the fetus. 2. The fine hair found on nearly

all the body except the palms and soles. p. 485.

Laparotomy (lap-ar-ot'o-me). 1. Surgical incision through the flank; celiotomy. 2. Abdominal section at any point.

Laparotrachelotomy (lap''ar-otrak''el-ot'o-me). Low, cervical cesarean section. p. 295.

Larynx (lar'inks). The organ of voice; the upper part of the trachea or wind-pipe.

Latent (la'tent). Quiet, inactive but present.

Laxative (laks'at-iv). Slightly purgative; a medicine which is mildly cathartic.

Layette (la-et') [Fr.]. Infant's wardrobe. p. 130.

Lesion (le'zhun). 1. Any hurt, wound, or local degeneration. 2. A diseased condition of a tissue.

Lethargic (le-thar'jik). In a state of lethargy.

Lethargy (leth'ar-je). Stupor or coma. Marked drowsiness.

Leukorrhea, Leucorrhea (lu-kor-re'ah). A whitish discharge from the vagina and uterus; the whites.

Ligature (lig'at-ūr). A thread or wire for tying a blood-vessel or strangulating a part.

Lightening (līt'en-ing). The sinking of the head into the pelvis in the last weeks of pregnancy. p. 69.

Linea (lin'e-ah). Latin for *Line*. A line. **L. al'ba** [L. "white line"]. The central tendinous line extending from the sternum to the pubic bone. **Lineae albican'tes**, "striae gravidarum." Shining, whitish, and purplish lines on the abdomen of pregnant women and those who have borne children. They are sometimes due to distention from other causes. pp. 64, 65.

Liquor (li'kwor) pl., *liquo'res* [L.]. A fluid or liquid. **L. am'nii**, the fluid contained in the amniotic sac, and surrounding the child. p. 51.

Lithopedion (lith-o-pe'de-on). "Stone-child." A fetus that has died and become changed into a hard mass of calcareous matter.

Lithotomy (lith-ot'o-me). The removal of a stone by cutting into the bladder; cystotomy. **L. position**, the patient lies on the back, with the legs and thighs well flexed, the knees widely separated, and hips well over the edge of the table. pp. 141, 266.

Lochia (lo'ke-ah). The vaginal and uterine discharge occurring for several days after delivery. **L. al'ba**, the whitish discharge normal after the first ten days of the puerperal state. **L. cruen'ta**, **L. ru'bra**, the blood-stained discharge occurring the first week after delivery. **L. sanguinolen'ta**, the watery bloody discharge from the third to sixth day. **L. serosa**, the pinkish or serous discharge after the first ten days. p. 79.

Lochial (lo'ke-al). Pertaining to the lochia.

Low forceps (lō for'seps). Forceps applied to the fetal head at the outlet of the pelvis. p. 273.

Lues. Syphilis. p. 588.

Lutein (lu'te-in). A hormone developed in the corpus luteum as the result of action upon it by the anterior pituitary.

Lying-in (li-ing-in'). The puerperal state. **L. fever**, puerperal fever. **L. hospital**, a hospital for the care of women during pregnancy and labor and after confinement: a maternity.

Lysis (li'sis). Gradual decline of fever.

Lysol. A solution of cresylic acid in water and soap; the liquor cresolis compositus of the U.S.P.

M.

Macerated (mas'er-a-ted). Softened and broken up by long-continued action of a fluid or by a digestive process.

Malaise (mal-āz') [Fr.]. Discomfort or uneasiness; indisposition.

Malposition (mal-po-zish'un). Abnormal position.

Malpractice (mal-prak'tis). Improper or injurious practice; unskilful or injurious medical or surgical treatment.

Mamma (mam'mah). The breast; the mammary gland. pp. 39, 81.

Mammary (mam'ar-e). Pertaining to the breast.

Mania (ma'ne-ah). A form of insanity in which there are excitement, delusions, and tendency to violence. p. 416.

Maniacal (man-i'ak-al). Affected with mania.

Manual (man'u-al). Pertaining to the hands; performed by the hands.

Marantic (mah-ran'tik). Having the nature of marasmus. p. 450.

Marasmus (mar-az'mus). A disease of young children in which there are progressive wasting and emaciation. p. 450.

Massage (mas-sazh'). The systematic employment of friction, kneading, and stroking of the body as a treatment for disease. pp. 215, 421.

Mastitis (mas-ti'tis). Inflammation of the breast. p. 429

Maternal (ma-ter'nal). Pertaining to the mother; derived from the mother. **M. impression**, the effect produced on the fetus *in utero* by the mental and other experiences of the mother during pregnancy. p. 103.

Maternity (mat-er'nit-e). 1. Motherhood. 2. A lying-in hospital. **M. nurse**, an obstetric nurse.

Mauriceau (maw-re-so'). A famous French obstetrician who lived in the eighteenth century.

Meatus (me-a'tus), pl., *mea'ti* [L. for "passage"]. A passage

or opening. **M. urina'rius**, the external opening of the urethra. pp. 37, 454.

Meconium (me-ko'ne-un) [L.]. The dark green substance found in the large intestine of the fetus, and evacuated during the first days. p. 87.

Median, Mesial (me'de-an, me'she-al). Middle.

Melancholia (mel-an-ko'le-ah). A form of insanity with depression of spirits and gloomy forebodings. pp. 218, 416.

Melena (mel-e'nah). 1. The passage of dark, pitchy feces, stained with blood-pigments, or containing blood. 2. The vomiting of altered blood; black vomit. p. 447.

Membrane (mem'brān). A thin layer of tissue covering a surface or dividing a space.

Mucous m., lining of cavities which communicate with the external air. **Serous m.**, the lining of one of the great body cavities.

Membranes (mem'brāns). A term to indicate the amniotic sac. p. 73.

Menopause (men'o-pawz). "Change of life." The period at which menstruation ceases.

Menses (men'sēz.) The normal monthly flow of blood from the uterus. pp. 44, 115.

Menstrual (men'stru-al). Relating to the menses.

Menstruate (men'stru-āt). To have the monthly flow.

Menstruation (men-stru-a'shun). The monthly flow; the menses; the function of menstruating. p. 44.

Mento-anterior (men''to-an-te're-or). Having the chin directed forward. p. 249.

Mentoposterior (men''to-pos-te're-or). Having the chin directed backward. p. 249.

Microscopic (mi-kro-skop'ik). Visible only with the aid of a microscope.

Micturition (mik-tu-rish'un). Urination.

Midwife (mid'wif). A woman who attends women in labor.

Miscarriage (mis-kar'rij). A term used by the laity to describe the expulsion of the fetus at any time during pregnancy. p. 68.

Misnomer (mis-no'mer). A wrong name.

Modification (mod''if-ik-ā'shun). An alteration; a change of form or condition. p. 523.

Mole (mōl). A fleshy mass formed in the uterus by the degeneration of an ovum in the early months of pregnancy. **Hydatidiform m.**, a grape-like degenerated ovum, due to disease of the villi.

Mons veneris. The large pad of fat over the pubes. p. 36.

Monster (mon'ster). A fetus formed with an excess, a deficiency, or a malposition of parts.

Monstrosity (mon-stros'it-e). A monster.

Montgomery's glands (mont-gom'er-ēz). Sebaceous glands in the areola around the nipple. p. 40.

Monthlies (month'lēz). The menses. p. 44.

Morbid (mor'bid). Diseased; pertaining to disease.

Morbidity (mor-bid'it-e). 1. The condition or state of being diseased. 2. The sick rate or proportion of disease to health in a community.

Morbus caeru'leus (mor'bus). Blue disease, "blue babies" have it. p. 452.

Mother's mark (muth'erz). Birthmark; nevus.

Mucosa (mu-ko'sah). Mucous membrane.

Mucous (mu-kus). Pertaining to or resembling mucus. **M. membrane**, the membranous lining of all cavities of the body which communicate with the external air.

Mucus (mu'kus). The viscid watery secretion of the mucous glands.

Multigravida (mul-te-grav'id-ah). A woman who has been pregnant several times.

Multipara (mul-tip'ar-ah). A woman who has born several children.

Mummification (mum''mif-ik-a'-shun). The drying and shriveling up of the fetus.

N.

Narcotic (nar-kot'ik). 1. Producing sleep or stupor. 2. A drug capable of producing sleep and relieving pain.

Nates (na'tēz). The buttocks.

Nausea (naw'se-ah). Tendency to vomit. Sickness at the stomach.

Navel (na'vel). The umbilicus. **N. string**, the umbilical cord.

Neonatorum (ne-o-na-to'rum). Of the newborn.

Neonatus (ne-o-na'tus). The newborn. p. 85.

Nephritis (nef-ri'tis). Inflammation of the kidney.

Neurotic (nu-rot'ik). Nervous. Affected with a nervous disease.

Neutral (nu'tral). Indifferent. Not decided or pronounced. **N. reaction**, a reaction that is neither acid nor alkaline; not turning litmus-paper either red or blue.

Nevus (ne'vus). 1. A birthmark. 2. A spot on the skin, either congenital or acquired after birth.

Nitrogenous (ni - troj'en - us). Containing nitrogen.

Nodular (nod'u-lar). Like a nodule; having nodules.

Nodule (nod'ul). A small rounded mass; a small node.

Normal (nor'mal). Natural; according to rule.

Nutrient (nu'tre-ent). 1. Nourishing. 2. A nutritious substance. **N. enema**, an injection into the rectum of easily digested food in liquid form. p. 595.

Nutriment (nu'trim-ent). Nourishment.

Nutrition (nu-trish'un). 1. The process of assimilating food. 2. Nourishment.

Nutritious (nu-trish'us). Nourishing.

Nutritive (nu'trit-iv). Same as nutrient. **N. enema**, nutrient enema. p. 595.

Nymphae (nim'fe). The labia minora. p. 37.

O.

Obstetric, Obstetrical (ob-stet'rik, ob-stet'rik-al). Pertaining to midwifery or obstetrics.

Obstetrician (ob - stet - rish'un). An accoucheur; one who is skilled in the delivery of women in labor.

Obstetrics (ob-stet'riks). The science and art of assisting women through pregnancy and labor during the puerperium; midwifery.

Occiput (ok'sip-ut) [L.]. The back part of the head. p. 247.

Oleum ricini (o'le-um ris'in-i). Castor oil. Dose, 3-8 drams. p. 210.

Oligohydramnios (ol''ig-o-hi-dram'ne-os). Scarcity of the amniotic fluid.

Opacity (o - pas ' it- e). An opaque spot; inability to transmit the rays of light.

Ophthalmia (of-thal'me-ah). Inflammation of the eye or of the mucous membrane lining the eyelids. **O. neonato'rum**, ophthalmia of the newborn. "Babies' Sore Eyes." p. 465.

Optimal (op'tim-al). Best, highest.

Organ (or'gan). Any part of the body having a special function.

Os (os). Latin for *mouth*. **O. u'teri**, the mouth of the uterus. **O. u'teri exter'num**, the external opening of the canal of the cervix. **O. u'teri inter'num**, the internal opening of the canal of the cervix. p. 34.

Os (os). Latin for *bone*. **O. innomina'tum**, innominate bone.

Osmosis (os-mo'sis). The passage of a fluid or of salts through a membrane.

Outlet (out'let). The lower limit of the cavity of the pelvis. Figs. 6, 8.

Ovarian (o - va 're - an). Pertaining to the ovary.

Ovary (o'va-re). The female sexual gland in which the ova are developed. The ovaries are situated in the pelvis, on either side of the uterus. p. 33, Fig. 15.

Oviduct (o'vid-ukt). The fallopian tube, which carries the ovum from the ovary to the uterus. Fig. 15.

Ovisac (o'vis-ak). Graafian follicle, which see.

Ovulation (o - vu - la ' shun). The formation and discharge of the unimpregnated ovum from the ovary. p. 41.

Ovule (o'vūl). The ovum within the graafian follicle.

Ovum (o'vum). 1. An egg. 2. The female reproductive cell. The human ovum is about $\frac{1}{125}$ inch in diameter. p. 48.

Oxytocic (oks - e - to ' sik). 1. Hastening delivery. 2. A drug which hastens delivery; pituitrin, ergot.

Ozena (o - ze'nah). A disease of the nose with an offensive discharge.

P.

Pack the uterus. To tampon the uterus. p. 308.

Pallor (pal'lor). Paleness; lack of color. pp. 380, 385.

Palpation (pal-pa'shun). Examination by the hand or by the sense of touch. **Obstetric p.**, palpation of the abdomen of the pregnant woman, to learn the size, position, and presentation of the fetus. p. 250.

Palpitation (pal-pit-a'shun). Unduly rapid action of the heart.

Paraplegia (par-ah-ple'je-ah). Paralysis affecting the lower half of the body. Paralysis of both legs. Usually associated with paralysis of the lower half of the trunk.

Paregoric (par - e - gor ' ik). Camphorated tincture of opium. An anodyne. Dose, 5-75 min. for an adult.

Parenteral (par - en ' ter - al). Otherwise than through the intestinal canal, *e. g.*, hypodermically, intravenously. p. 596.

Paresis (par ' e - sis). Partial paralysis.

Parietal (par - i ' et - al). Pertaining to the walls of a cavity or organ. **P. bones**, the two large bones forming the sides and top of the skull. p. 56.

Paroxysm (par ' oks - izm). A sudden recurrence or increased severity of symptoms. A periodic attack of symptoms.

Paroxysmal (par - oks - iz ' mal). Having paroxysms.

Parturient (par - tu ' re - ent). Child-bearing. Giving birth. **P. canal**, the uterus and vagina considered as one canal. **P. woman**, a woman in labor.

Parturition (par - tu - rish ' un). The process of giving birth to a child.

Pasteur (pas-ter'). A noted French chemist; born, 1822; died, 1895.

Pasteurization (pas '' tur - iz-a'shun). The checking of fermentation (especially in milk) by heating to a temperature of from 155° to 170° Fahrenheit for thirty minutes.

Paternal (pa-ter'nal). Relating to or derived from the father.

Pathologic, Pathological (path-o-loj'ik, path-o-loj'ik-al). Morbid; diseased.

Pathology (path - ol ' o - je). The science which treats of the nature of disease and the changes in the body caused by disease.

Pedunculated (pe-dung'ku-la-ted). Having a peduncle or stem.

Pellicle (pel'ik-l). A thin skin or film. A film on the surface of a liquid.

Pelvimeter (pel-vim'e-ter). An instrument for measuring the diameters of the pelvis. p. 147.

Pelvimetry (pel - vim ' et - re). The measurement of the pelvis. **External p.**, external measurements. **Internal p.**, internal measurements. p. 550.

Pelvis (pel'vis). The basin shaped ring of bone at the lower extremity of the trunk. It is formed in front and at the sides by the innominate bones, and behind by the sacrum and coccyx. pp. 25, 30.

Pemphigus (pem'fig-us). An eruption on the skin consisting of large flat blebs filled with serum or pus.

Pepsin (pep'sin). 1. A ferment of the gastric juice which digests proteins. 2. That used as a medicine is derived from the stomach of pigs. Dose, 10-15 grains.

Peptic salt (pep'tik sawlt). A combination of table salt and scale pepsin. p. 508.

Perforator (per'fo-ra-tor). An instrument for piercing the bones of the fetal head.

Perineorrhaphy (per''e-ne-or'a-fe). The operation of suturing a tear or laceration of the perineum. pp. 175, 307.

Perineum (per-e-ne'um). The tissue between the anus and vulva. p. 38.

Periphery (per-if'er-e). The circumference; the portion farthest from the center.

Peristalsis (per-is-tal'sis). The worm-like movements by which the stomach and bowels propel their contents. It is produced by the contraction of the circular and longitudinal muscular fibers of these organs.

Peristaltic (per-is-tal'tik). Pertaining to peristalsis.

Peritoneal (per''it-o-ne'al). Pertaining to the peritoneum.

Peritoneum (per''it-o-ne'um). A serous membrane which lines the abdominal walls and covers all the organs contained in the abdomen.

Peritonitis (per''it-o-ni'tis). Inflammation of the peritoneum.

Pernicious (per-nish'us). Dangerous; tending toward a fatal result.

Perspiration (per-spir-a'shun). 1. Sweat. 2. The function of sweating.

Pessary (pes'ar-e). An instrument placed in the vagina to act as a support to the uterus.

Phantom (fan'tum). An effigy of a child or mother used to illustrate the mechanism of labor.

P. pregnancy, pseudoeypesis; a peculiar enlargement of the abdomen sometimes occurring in hysterical women and resembling the abdomen of a pregnant woman. **P. tumor**, a tumor of the abdomen due to flatus or the contraction of the muscles of the abdomen; phantom pregnancy.

Pharmacopeia (far'mak-o-pe'ah). A book containing directions for preparing medicines. Published by authority in the United States every ten years.

Phenomenon ((fe-nom'en-on), pl., *phenom'ena*). Any remarkable appearance. Any sign or symptom.

Phimosis (fi-mo'sis). A tightness of the foreskin so that it cannot be drawn back to uncover the glans of the penis.

Phlegmasia alba dolens (fleg-ma'zhe-ah al'ba do'lens). "Milk leg." Inflammation of the femoral vein occasionally following labor and typhoid fever. It is characterized by a painful swelling of the leg without redness. p. 407.

Phlegmatic (fleg-mat'ik). Sluggish, heavy, dull.

Phlegmon (fleg' mon). Inflammation of connective tissue with the formation of an abscess.

Physical (fiz'ik-al). Pertaining to nature or to the body.

Physiologic (fiz'' e - o - loj'ik). Pertaining to physiology; normal.

Physiology (fiz-e-ol'-o-je). The science which treats of the living body and its parts and functions.

Physique (fi - zēk'). Natural constitution; physical structure of a person.

Physometra (fi - so - me' trah). Distention of the uterus with gas or air.

Pigment (pig'ment). 1. Coloring matter found in organs and tissues of the body. 2. A dye or paint. A paint-like medicinal preparation to be applied to the skin.

Pigmentation (pig - men - ta' shun). The deposit of pigment in a part. The discoloration of a part by pigment. See *Chloasma*. p. 65.

Pipet (pi-pet') [Fr.]. A slender glass tube used for transferring liquids.

Placenta (pla - sen' tah). The after-birth; the round flat organ in the pregnant uterus which establishes communication between mother and child. pp. 59, 77. **P. prae'via**, a placenta which is situated over the internal os. It may cause fatal hemorrhage. p. 359.

Pledget (pled'jet). A plug; a sponge; a small compress or tuft. p. 564.

Plethora (pleth'o-rah, pleth-o'rah). A condition in which there is an excess of blood in the vessels. It is attended by a feeling of fulness in the head, florid complexion, and a tendency to nose-bleed.

Plethoric (pleth-or'ik, pleth'-or-ik). Full-blooded.

Pleura (plu'rah). The serous membrane that lines the cavities of the chest and covers the lungs.

Pleural (plu'ral). Pertaining to the pleura.

Podalic (po-dal'ik). Relating to, or by means of, the feet.

P. ver'sion, the turning of the child in the uterus so that the feet are made to present.

Pole (pōl). Either extremity of any axis.

Polyhydramnios (pol''e-hi-dram'ne-os). Excessive amount of liquor amnii.

Polyuria (pol-e-u're-ah). Increased urination. p. 83.

Position (po-zish'un). 1. The attitude of a patient. 2. The attitude of the fetus in the uterus; the relation which the head of the child bears to the mother's pelvis. If the child's occiput is pointing toward the left side of the mother, it is a left position. p. 245.

Posterior (pos-te're-or). Situated behind or to the rear.

Postnatal (post-na'tal). Occurring after birth.

Postpartum (post-par'tum). Occurring after delivery. **P. chill**, a chill lasting several minutes which sometimes follows delivery. **P. hemorrhage**, hemorrhage following delivery. p. 380. **P. shock**, the exhaustion following labor.

Postpuerperal (post-pu-er'per-al). Occurring after child-birth.

Precordia (pre-kor'de-ah). The fore part of the thorax; the region in front of the heart.

Precordial (pre-kor'de-al). Pertaining to the precordia.

Pregnancy (preg'nan-se). Gestation; the condition of being with child. The duration of pregnancy is about two hundred and eighty days. p. 62.

Pregnant (preg'nant). With child; gravid.

Premature (pre - mat - ūr). Occurring before the proper time. **P. infant**, an infant born of a premature labor. **P. labor**, labor occurring from the twenty-eighth to the thirty-eighth week of pregnancy. **P. respiration**, respiration of the child before it is completely born.

Premonitory (pre-mon'it-o-re). Serving as a warning. **P. pains**, uterine pains occurring before the beginning of true labor.

Prepuce (pre'pūs). The foreskin; the fold of skin which covers the glans penis. **P. of the clitoris**, the fold of mucous membrane which covers the glans of the clitoris.

Presentation (pre-zen-ta'shun). That portion of the fetus which occupies the lower segment of the uterus and first enters the birth-canal. p. 245.

Primigravida (prim-ig-rav'id-ah). A woman pregnant for the first time.

Primipara (pri-mip'-ah-rah). From *primus*, first, and *parere*, to bring forth. A woman who is giving or who has given birth to her first child.

Prodromal (pro-dro'mal). Preparatory, in advance. *Prodromata*, advance symptoms.

Prognosis (prog-no'sis). A forecast as to the probable result of a disease.

Prognostic symptom (prog - nos'tik simp'tum). A symptom from which a prognosis may be made.

Prognosticate (prog-nos'tik-āt). To make a prognosis.

Prolapse (pro'laps). A falling down of an organ. **P. of the cord**, the descent of the umbilical cord along with or ahead of the presenting part of the fetus. p. 375. **P. of the uterus**, "falling of the womb."

Promontory (prom'on-to-re). A projection or prominence. **P. of the sacrum**, the upper pro-

jecting part of the sacrum. Fig. 1.

Prophylactic (pro-fil-ak'tik). Pertaining to prophylaxis; preventive.

Prophylaxis (pro-fil-ax'is). The prevention of disease; preventive treatment.

Protargol (pro-tar'gol). A soluble yellowish powder; a preparation of silver. It is a germicide used in gonorrhea and sore eyes and wounds. p. 179.

Protein (pro'te-in). An important class of organic compounds, including albumin, casein, gluten, and fibrin, forming the important part of the tissues of the body. p. 513.

Pruritus (pru-ri'tus). Intense itching. p. 333.

Pseudocyesis (su''do-si-e'sis). Imagined pregnancy; phantom tumor. p. 114.

Psycho-analysis (si-ko-an-al'y-sis). A study of the mind by investigating the feelings, emotions, dreams, and other mental operations.

Psychic, Psychical (si'kik, si'kik-al). Pertaining to the mind.

Psychosis (si-ko'sis). Any disease or disorder of the mind.

Psychotherapy (si-ko-ther'ap-e). Cure of disease by means of mental suggestion.

Ptyalism (ti'al-izm). Excessive secretion of saliva. p. 66.

Puberty (pu'ber-te). The age at which the organs of reproduction become functionally active. p. 42.

Pubes, Pubis (pu'bēs, pu'bis).
1. The os pubis; the pubic bone. It is the anterior portion of the os innominatum, but in fetal life it is a separate bone.
2. The external part of the generative region, which is more or less covered with hair after puberty. p. 30.

Pubic (pu'bik). Pertaining to the pubes. p. 30.

Pubiotomy (pu - be - ot'o-me). Section of the os pubis at one side of the symphysis for the purpose of enlarging the pelvis. p. 302.

Pudenda (pu - den ' dah). Plural of *Pudendum*. p. 36.

Pudendum (pu - den ' dum). The external genitals, especially of the female. p. 36.

Puerpera (pu-er'per-ah) [from *puer* a child, and *parere*, to bring forth]. A woman in child-bed. p. 77.

Puerperal (pu - er ' per - al). Relating to child-bed. **P. convulsions**, those occurring during or immediately after labor. **P. eclampsia**, same as puerperal convulsions. See *Eclampsia*. **P. fever**, fever due to infection during or immediately after labor; puerperal infection. **P. insanity**, **P. mania**, insanity developing in the latest period of pregnancy or just after labor. **P. state**, the condition of a woman during the ten days after labor or during the period of convalescence after labor. p. 77.

Puerperium (pu-er-pe're-um). The period or state of confinement after labor. p. 77.

Pulmonary (pul ' mo - na - re). Pertaining to the lungs.

Pulsation (pul - sa ' shun). A throb or rhythmic beat, as of the heart.

Purpura (pur'pu-rah). A disease in which there are purple patches on the skin and mucous membrane, due to hemorrhage under the skin. There may or may not be fever present.

Purpuric (pur-pur'ik). Relating to purpura.

Purulent (pu-ru'lent). Consisting of or containing pus.

Pus (pus). A liquid, the product of inflammation, made up of white blood-cells and a thin fluid, which is found in abscesses and

on the surface of sores; matter; corruption.

Pyelitis (pi''e-ly'tis). An inflammation of the pelvis or lining membrane of the kidney. p. 470.

Pyloric (pi-lor'ic). Pertaining to the pylorus, the orifice of the stomach leading into the duodenum. **P. stenosis**, narrowing of the pylorus. p. 445.

Pyosalpinx (pi-o-sal'pinks). A collection of pus in the fallopian tube.

Pyromania (pi - ro - ma ' ne - ah). A nervous affection characterized by a desire to set fire to things.

Q.

Quickening. First perception by the mother of the movements of the child *in utero*. "Feeling life" occurs from the fifteenth to twentieth week.

R.

Racemose (ras ' em - ōs). Resembling a bunch of grapes. p. 39.

Rachitic (rak-it'ik). Affected with rickets. **R. pelvis**, a pelvis deformed by rickets. p. 31.

Rachitis (rak-i'tis). Rickets.

Ramus (ra'mus), pl., *ra'mi*. The arms of the innominate bones which unite and form the pubes.

Rational (rash ' un - al). 1. Reasonable. 2. Based on reasoning. **R. symptoms**, subjective symptoms—those given by the patient.

Reaction (re-ak'shun). 1. Response to stimulation. 2. The phenomena caused by chemicals acting upon one another.

Rectal (rek ' tal). Pertaining to the rectum. **R. alimentation**, the administration of food by injecting it into the rectum. p. 595.

Rectum (rek'tum). The lower part of the large intestine lying in the pelvis and terminating at the anus. p. 36.

Reflex (re'flex). 1. Reflected. 2. A term applied to certain involuntary movements.

Regurgitation (re - ger - jit - a' shun). 1. A flowing back. 2. The passive vomiting of infants. 3. The return of food to the mouth unaccompanied by nausea.

Relaxation (re - lak - sa' shun). 1. Lack of muscular tone and strength. 2. A lessening of tension.

Remission (re-mish'un). An abatement of symptoms.

Renal (re'nal). Pertaining to the kidney.

Respiration (res - pir - a' shun). The act of breathing, including inspiration and expiration.

Restitution (res - tit - u' shun). The rotation of the presenting part of the fetus, outside the birth canal, so that it looks in the same direction that it did before entering the pelvis.

Resuscitation (re'' sus - it - a' shun). The restoration to consciousness of one who is apparently dead. p. 480.

Retained placenta (re-tānd'). A placenta not expelled by the uterus after labor.

Retention (re-ten'shun). The persistent keeping within the body of matters that should normally be excreted. **R. of urine**, a condition in which the urine cannot be voluntarily discharged. p. 83.

Rhinitis (ri-ni'tis). Inflammation of the mucous membrane of the nose.

Rhinorrhea (ri'nor-re''ah). A watery discharge from the nose, common in hay-fever, etc.

Rhomboid (rom' boyd). A quadrilateral figure, usually lozenge shaped. **R. of Mich-**

aëlis, a space on the lower back. p. 552, Fig. 248.

Rickets (rik'cts). A constitutional disease of infants and young children in which there is lack of earthy salts in the bones. It results in deformities and curvatures of the bones, and is caused by deficiency in the food, of calcium, phosphates, vitamins, and lack of sunlight.

Rotation (ro - ta' shun). The act of turning round on an axis. **R. stage of labor**, a movement in labor by which the occiput turns to the front or rear. p. 29.

Rumination (room-in-a'shun). A habit some babies have of regurgitating, chewing, and spitting out the food.

Rupture (rup'tūr). 1. A forcible tearing of a part. 2. A hernia. p. 476.

S.

Saccharum lactis (sak'ar - um lak'tis). Sugar of milk; lactose. p. 514.

Sacro-anterior (sa''kro-an-te' re-or). Having the sacrum pointing to the front. p. 248.

Sacro-posterior (sa''kro-pōs-te' re-or). Having the sacrum pointing to the back. p. 248.

Sacrum (sa'krum). The triangular bone which forms the back of the pelvis. Above, it articulates with the spinal column, and below, with the coccyx. It is formed by the fusion of the five sacral vertebrae. p. 26.

Sagittal (saj'it-al). Shaped like an arrow. **S. suture**, the suture between the two parietal bones. p. 56.

Saliva (sal-i'vah). Spit; the clear, viscid, alkaline digestive fluid secreted by the salivary glands in the mouth. It contains a ferment, ptyalin, which converts starch into maltose.

Salivation (sal-iv-a'shun). An excessive flow of saliva; ptyalism. pp. 66, 589.

Sarcomphalus (sark - omf' al - us). Fleshy navel; granulations in the navel following fault exfoliation of the cord stump.

Saturated solution (sat'u-rated). A solution which will not contain any more of a given substance.

Scalpel (skal'pel). A small straight knife with a convex cutting edge.

Scapula (skap' u - lah). The shoulder-blade.

Scopolamin (sko - pol - am' in). A new drug derived from the scopolamina japonica, often used in combination with morphin for the production of anesthesia. p. 197.

Scorbutus (skor - bu' tus). Scurvy.

Scrotum (skro' tum). The pouch which contains the testicles.

Scurvy (skur've). A food deficiency disease marked by ulcerated gums, hemorrhages, and general malnutrition.

Scybala (sib'al-ah). Hardened fecal masses.

Sebaceous (se - ba' shus). 1. Pertaining to sebum or fat. 2. Secreting a greasy substance or sebum.

Sebum (se'bum). A thick, semi-liquid substance, composed of fat and broken-down epithelial cells, which is discharged upon the skin.

Secretion (se - kre' shun). 1. The process of separating various substances from blood. 2. Any secreted substance.

Secundines (se - kun' dinz). The after-birth and membranes. pp. 59, 77.

Segmentation (seg - men - ta' shun). The division into parts, more or less similar, especially that which takes place in the fertilized ovum.

Semen (se'men). 1. A seed. 2. The fluid secreted by male generative organs.

Semilunar (sem - il - u' nar). Shaped like a crescent.

Sepsis (sep'sis). Infection by bacteria. p. 387.

Septic (sep'tik). Produced by or due to infection.

Serous (se'rus). Having the nature of serum.

Serum (se'rum). The clear, straw-colored liquid which, in the clotting of blood, separates from the clot and corpuscles.

Shock (shok). Sudden depression of the vital powers due to an injury or powerful emotion. That due to injury is *surgical* shock; that due to emotion is *mental* shock.

Show (shō). 1. The blood-tinged discharge of mucus from the cervix preceding labor. p. 70. 2. The vaginal discharge of menstruation.

Sialorrhea (si'al-or-c'ah). Excessive secretion of saliva, or salivation. p. 66.

Sigmundine, Justine (sig-mun'-dēn). A midwife who lived in the seventeenth century.

Sims, J. Marion (simz). A noted American gynecologist who lived in the nineteenth century.

S's position, the patient lies on the left side and the chest, the right knee and thigh well drawn up, the left arm along the back or over the edge of the table. p. 377. **S's speculum**, a vaginal speculum or retractor.

Sinus (si'nus). 1. A body cavity, *e. g.*, the antrum in the face, the ethmoids in the nose. 2. A large blood-vessel with only a few layers of cells in the walls, *e. g.*, in the uterus.

Siphon, Syphon (si'fon). A bent tube by which liquid may be transferred from one vessel to another over an intervening elevation.

Skim milk (skim milk). Milk from which the cream has been removed; it contains from 1 to 2 per cent. fat.

Smegma (smeg'mah). The secretion of the sebaceous glands under the prepuce and around the labia minora. p. 37. **S. embryo-num**, vernix caseosa. (Rare.)

Sodium bicarbonate. Baking soda. Dose 5-30 grains. p. 563. **S. carbonate**. Washing soda.

Solution (so-lu'shun). 1. The process of dissolving. 2. A liquid containing dissolved matter.

Sordes (sor'dez). The foul matter which collects on the lips and teeth in typhoid and other fevers and conditions.

Sound (sownd). An instrument to be introduced into a cavity to detect a foreign body or dilate a stricture.

Spastic (spas'tik). A term applied to muscle that is rigidly contracted.

Specific (spe-sif'ik). 1. Pertaining to species. 2. Produced by a single kind of organism. 3. A remedy which has a peculiar efficiency in a certain disease. **S. disease**. 1. A disease produced by a specific cause. 2. The term is sometimes restricted to syphilis. p. 588. **S. gravity**, the weight of a substance compared with an equal volume of another substance taken as a standard. Hydrogen is the standard for gases and distilled water for liquids.

Spermatozoid (sper-mat-o-zo'id). Same as *Spermatozoön*.

Spermatozoön (sper-mat-o-zo'on), pl., *spermatozoa*. The motile, microscopic, sexual element of the semen—the male element of fertilization.

Spir'itus Æ'theris Nitro'si. Sweet spirits of niter; dose, $3\frac{1}{2}$ – $3\frac{1}{2}$. **S. frumen'ti**, whisky.

Sprue (sproo). Thrush; a sore mouth of infants, with the formation of whitish patches and superficial ulcers. p. 448.

Stasis (sta'sis). Stagnation; non-movement: usually applied to fluids.

Stenosis (ste-no'sis). A narrowing, usually referred to an orifice.

Sterile (ster'il). 1. Barren. 2. Not containing micro-organisms; aseptic; surgically clean.

Sterility (ster - il'it - c). The condition of being barren. Inability to become pregnant.

Sterilization (ster - il - iz - a' shun). The process of rendering an object free from germs. p. 123.

Sterilizer (ster'il - i - zer). An apparatus for sterilizing. p. 561.

Still-born. Born dead. p. 479.

Stimulant (stim'u - lant). 1. Stimulating. 2. A medicine which produces stimulation.

Stimulate (stim-u-lāt). To excite to functional activity.

Stimulus (stim' u - lus). An agent that excites to functional activity.

Stool (stool). The feces discharged from the bowels.

Streptococcus (strep - to - kok' us). A variety of micro-organisms. It causes the severest child-bed infections.

Stria (stri'ah), pl., *stri'ae*. A streak or line. **S. grvida'rum**, the striae seen on the abdomen of women who are or have been pregnant. See *Linea albicantes*. pp. 64, 65.

Strophulus (strof'u-lus). An eruption of infants called "tooth-rash" or "gum-rash." p. 459.

Stupor (stu'por). Unconsciousness, partial or complete.

Styptic (stip'tik). 1. Astringent. 2. A remedy that is markedly astringent and hemostatic.

Subcutaneous (sub - ku - ta' ne-us). Under the skin. **S. injection**. See *Hypodermic injection*.

Succedaneum (suk - se - da' ne-um). A medicine that may be substituted for another of like properties. **Caput s.**, a dropsical swelling on the presenting part of the fetal head during

labor, due to lack of pressure on the part and pressure on the surrounding area. p. 474.

Superior strait (su-pe're-or). The upper border of the true pelvis; the inlet; the brim. p. 28.

Suppository (sup - oz ' it - o - re). An easily fusible medicated mass introduced into the rectum, urethra, or vagina.

Suppuration (sup - u - ra ' shun). The formation of pus.

Suppurative (sup ' u - ra - tiv). Producing or discharging pus.

Suture (su'tūr). 1. A surgical stitch or seam. p. 176. 2. The material used for a suture. 3. The line of union between two bones of the head or face. pp. 56, 57.

Symphysiotomy (sim-fiz-e-ot'o-me). The operation of severing the ligaments and cartilage forming the pubic joint or symphysis. Done in difficult labor. p. 302.

Symphysis (sim'fiz-is). 1. A kind of firm joint. 2. The term is used to refer to the *symphysis pubis* or union between the two pubic bones. p. 30.

Synchondrosis (sin-kon-dro' sis). The union of bones by means of elastic cartilage.

Syncope (sin ' ko - pe). Fainting; a swoon; a more or less complete sudden failure of respiration and heart action. p. 381.

Syphilis (sif'il-is). An infectious disease, usually venereal in origin, very chronic and obstinate in nature. p. 588.

Systolic (sis ' tol - ic). During the contraction of the heart.

T.

Tampon (tam'pon). 1. A plug of cotton, gauze, or other material, placed in a cavity to stop a hemorrhage or absorb secretions. 2. To place a tampon. p. 308.

Tamponade, Tamponage (tam'-pon-ād, tam'pon-āj). The use of the tampon. p. 308.

Tamponing (tam ' pon - ing). The act of using the tampon. p. 308.

T-bandage. A bandage shaped like the letter T; used to retain dressings of the vulva in place. p. 124.

Tenaculum (ten-ak'u-lum). A hook-shaped instrument; a hook.

T. forceps, a forceps armed with hooks; a volsellum. p. 279.

Tenesmus (ten - es ' mus). Straining; ineffectual straining at stool or at urination; a feeling of desire to strain at stool, etc.

Term (turm). The natural end, or termination of pregnancy.

Testicle (tes'tik-l). One of the two male organs in the scrotum, analogous to the ovary in women.

Tetanus (tet ' an - us). Lock-jaw; a disease caused by the bacillus of tetanus, and in which there are tonic spasms of some of the voluntary muscles, first noticed in the muscles of jaw and throat.

Thermostat (ther ' mo - stat). An apparatus for automatically regulating heat. p. 488.

Thoracic (tho - ras ' ik). Pertaining to the thorax.

Thorax (tho'raks). The part of the body above the diaphragm. It contains the heart and lungs.

Thrombosis (throm ' bo - sis). The formation of a thrombus or clot in a vessel. p. 407.

Thrombotic (throm - bot ' ik). Pertaining to or of the nature of a thrombus. p. 407.

Thrombus (throm ' bus). A clot in a blood-vessel remaining at the point of its formation.

Thrush (thrush). Sore mouth; sprue. Caused by a vegetable fungus called *Monilia albicans*. pp. 448, 508.

Tissue (tish'u). An aggregation of cells forming a structure with a definite function.

Torsion (tor'shun). Twisting. **T. of the umbilical cord**, the spontaneous twisting of the cord *in utero*.

Tourniquet (toor'ne-ket). A constrictor, usually rubber, applied tightly around an extremity to stop hemorrhage.

Toxemia (toks - e' me - ah). A condition due to the presence of toxins in the blood. These toxins may be the product of bacterial action, or they may be effete matter which should be excreted. pp. 107, 337, 344.

Toxicosis (tox - i - ko' sis). A disease caused by a toxemia.

Trachea (tra'ke - ah). The windpipe; the air-tube leading from the larynx to the bronchi.

Tracheal catheter (tra'ke-al). A slender tube or catheter for drawing mucus and fluids from the trachea in case of asphyxiation, and blowing air into the lungs. p. 480.

Traction (trak'shun). The act of drawing or pulling. **T. sling**, a tape used to draw out the baby with.

Transfusion (trans - fu' zhun). 1. The transfer of blood from one person to another. 2. The introduction into the blood-vessels of any liquid, as salt solution. p. 318.

Trendelenburg position (tren'-del-en-berg). The patient lies flat on the back. The end of the table is elevated so that the hips are raised to an angle of 45 degrees. The legs hang over the end of the table. Used in abdominal operations and in the treatment of prolapse of the cord. p. 377.

Trichomonas (trik-om'o-nas). An animalcula inhabiting the intestines or vagina.

Tubercle (tu'ber - kl). A rounded nodule or elevation.

Tuberculosis (tu-ber-ku-lo'sis). An infectious disease caused by tubercle bacilli, and characterized by the formation of tubercles. In the lungs it is called consumption.

Tumor (tu'mor). 1. A swelling. 2. A new growth; a tissue which grows independent of surrounding structures and has no physiologic use. A tumor which tends to recur after removal is *malignant*, one which does not is *benign*.

Tympanites (tim - pan - i' tez). Distention of the bowels or peritoneal cavity with air or gases. p. 409. **Uterine t.**, distention of the uterus with gas. *Physometra*.

Typhoid fever (ti' foid). A specific fever due to the *Bacillus typhosus*, and following a particular course. **T. state**, a condition of great physical exhaustion, with stupor and delirium, resembling that found about the close of the second week of typhoid. It may occur in toxemia and puerperal infection.

U.

Ulcer (ul'ser). An open sore.

Ulcerate (ul'ser-āt). To form an ulcer; to be affected with ulcers.

Umbilical (um-bil'ik-al). Pertaining to the umbilicus or navel. **U. arteries**, the arteries forming part of the umbilical cord. **U. cord**, the cord connecting the placenta with the umbilicus of the fetus. It is made up of the umbilical arteries and vein and a jelly-like substance called "Wharton's jelly." p. 52. **U. hernia**, hernia at the navel. **U. veins**, the veins of the umbilical cord.

Umbilicus (um - bil - i' kus). The navel; the site of entrance of the umbilical vessels into the abdomen. p. 464.

Urea (u-re'ah). The principal solid of the urine; it carries off most of the waste nitrogenous products of the body.

Uremia (u-re'me-ah). The toxic condition produced by the presence of urinary constituents in the blood. It is due to the diminution of excretion by way of the urine and is marked by nausea, vomiting, dizziness, headache, convulsions, and coma.

Uremic (u-re'mik). Affected with uremia.

Urethra (u-re'thrah). The membranous canal leading from the bladder to the surface of the body. p. 35.

Urethral (u-re'thral). Pertaining to the urethra. p. 35.

Uric acid (u'rik). A crystallizable acid found in urine. It is nearly insoluble, and when retained in the system is thought to produce gout and rheumatism.

Urinal (u'rin-al). A vessel to receive urine.

Urinalysis (u-rin-al'is-is). The analysis of urine.

Urine (u'rin). The fluid secreted by the kidneys, stored in the bladder, and discharged through the urethra. **Incontinence of u.**, inability to retain urine in the bladder, so that it escapes involuntarily; **incontinencia paradoxa**, filling of the bladder, with overflow and dribbling away of urine. **Retention of u.**, inability to pass the urine. **Suppression of u.**, arrested secretion of urine by the kidneys.

Urinometer (u-rin-om'et-er). An instrument for determining the specific gravity of urine.

Urticaria (er-ti-kar'iah). A disease consisting of wheals, or hives (raised itchy whitish spots) on the skin.

Uterine (u'ter-ēn). Pertaining to the uterus or womb. **U. appendages**, the fallopian tubes and the ovaries. **U. atony**, weak-

ness of the uterine muscle; term used during and after labor.

U. colic, pains in the uterus from any cause except labor-pains.

U. gestation, normal pregnancy.

U. inertia, lack of contractile power of the uterus during labor: "weak pains"; atony. **U. in-**

volution, the process by which the uterus regains its ordinary size and shape after labor. **U. mole**,

a mass in the uterus consisting of a dead fetus and its envelopes.

U. phlebitis, a form of puerperal fever. **U. pregnancy**, normal pregnancy.

U. probe, a long, flexible probe for exploring the uterus. **U. sinuses**, the veins of the uterus enlarged by preg-

nancy. **U. sound**, a uterine probe. **U. tubes**, fallopian tubes.

U. wound, the area from which the placenta has been removed.

Uterus (u'ter-is). The womb; the hollow muscular organ in which the fetus is normally developed. p. 32.

V.

Vagina (vaj-i'nah). The curved canal extending from the cervix of the uterus to the vulva. pp. 34, 80.

Vaginal (vaj'in-al). Pertaining to the vagina. **V. examination**, examination of the pelvic organs by means of the finger introduced into the vagina. **V. speculum**, an instrument for holding the vagina open in order that its interior may be inspected.

Valance (val'anz). Hanging drapery about a bedstead. p. 140.

Varicose (var'ik-ōs). 1. Unnaturally swollen or dilated; a term applied to veins. 2. Pertaining to a varix. p. 330.

Varicosity (var-ik-os'it-e). 1. A varicose condition of the veins. 2. A varix. p. 330.

Varix (va'rix). An enlarged tortuous vein. p. 330.

Vascular (vas'ku-lar). Having blood-vessels; full of blood-vessels.

Vascularity (vas-ku-lar'it-e). The condition of being vascular.

Vectis (vek'tis). A curved lever for making traction on the fetal head during labor; almost obsolete now.

Vein (vān). A blood-vessel carrying blood to the heart.

Venesection (ven-e-sek'shun). To open a vein and let blood escape. Bleeding.

Venous (ve'nus). 1. Pertaining to the veins. 2. Contained in the veins. **V. blood**, the dark colored blood collected from the tissues and carried by the veins to the heart. It is dark from the lack of oxygen and the presence of carbon dioxid. **V. circulation**, the circulation of blood through the veins. **V. congestion**, the engorgement of an organ with venous blood, due to an obstruction to its return to the heart.

Vernix caseosa (ver'nix ka-sc-o'sah). "Cheesy varnish." The greasy substance which covers the skin of the fetus. p. 87.

Version (ver'shun). 1. The act of turning. 2. The turning of the fetus *in utero* by the obstetrician to facilitate delivery. pp. 256, 282.

Vertebra (ver'te-brah). Any one of the thirty-three bones of the spinal column.

Vertex (ver'tex). 1. Head. 2. The crown of the head. **V. presentation**, the presentation of the top of the fetal head in labor. p. 246.

Vertigo (ver'tig-o). Dizziness; giddiness; "swimming of the head."

Vesical (ves'ik-al). Pertaining to the bladder.

Vesicle (ves'ik-l). 1. A small bladder or sac containing liquid. 2. A small blister on the skin or mucous membrane. p. 459.

Vesicular (ves - ik ' u - lar). 1. Composed of small, sac-like bodies. 2. Composed of vesicles or blisters on the skin. p. 459.

Vestibule (ves'tib-ūl). 1. The oval cavity of the internal ear. 2. The space between the labia minora, below the clitoris, just above the entrance to the vagina. p. 37.

Viability (vi - ab - il ' it - e). Ability to live. p. 485.

Viable (vi'ab-l). Able or likely to live outside the uterus. Said of a fetus that is sufficiently developed to live outside the uterus. p. 485.

Villus (vil'us), pl., *vil'li*. 1. One of the small vascular projections of the placenta which help attach it to the wall of the uterus and through which the nourishment of the child is provided. pp. 50, 59. 2. One of the club-shaped projections from the mucous membrane of the intestines.

Virulent (vir'u-lent). Exceedingly poisonous or harmful; having the nature of virus.

Virus (vi'rus). 1. Any animal poison. 2. Especially that poison which is produced by and able to impart disease. The poison is due to the presence of disease-producing organisms or fluids.

Viscus (vis'kus), pl., *vis'cera*. Any organ contained within the cavities of the body, especially the abdomen.

Visual (viz'u-al). Pertaining to vision or sight.

Vital (vi'tal). Essential to life. Pertaining to life.

Vitality (vi-tal'it-e). The vital principle. The vital power.

Vitamin (vi - tam ' in). Those parts of food, whose chemical composition is still unknown, but which are necessary to the life of the individual. Some are soluble in fats, some in water. p. 535.

Volsella, Volsellum (vol - sel' ah, vol-sel'um). A forceps the ends of whose blades are furnished with sharp hooks.

Vulsella, Vulsellum (vul-sel' ah). Same as *Volsella*.

Vulva (vul' vah). The external genitals of the female. pp. 34, 36.

W.

Walcher's position (vahl'kerz). The patient lies on her back with the buttocks raised and well over the table, the legs hanging down. In this position the true conjugate diameter of the pelvis is increased nearly half an inch. p. 267.

Wassermann reaction. A test of the blood which often shows the presence of syphilis. p. 118.

Wet-nurse (wet - nurs). A woman who suckles the child of another. p. 441.

Wharton's gelatin, Wharton's jelly (hwart'unz). The jelly-like tissue which makes up the greater part of the umbilical cord.

Whites (hwitz). Leukorrhea.

Winckel's disease (wink'lz). An extremely fatal disease in the newborn, marked by jaundice, bloody urine, hemorrhage, and cyanosis. Malignant jaundice.

Witches' milk (witsh'ez). The milky fluid secreted by the breast of the newborn. p. 462.

Womb (woom). The uterus. p. 32.

X.

Xerophthalmia (zer-oph-thal'me-a). A disease of the eyes due to deficiency of protective substances (vitamins). Corneal ulcerations, and loss of the eye and sight may result.

AN OUTLINE FOR STUDY

IN SIXTEEN LESSONS

PREFACE

In most hospitals and especially in those giving short courses of maternity training, the teaching of the theory of obstetrics must be done in a small number of hours of class work. It is manifestly impossible to cover so important and so large a subject in the exhaustive manner in which it is given in the book, during such a short period.

Superintendents of nurses and instructresses have expressed the need for a synopsis or outline which would enable them to convey a comprehensive knowledge of the matter in the text in a given number of hours, and student nurses have also desired a plan for study which would help them in the preparation of their lessons.

The American Journal of Nursing published in March, 1926 an Outline for obstetric teaching, consisting of thirty hours, of which ten were given by the staff physician, the balance being held by the supervising obstetric nurse or general instructress. In the synopsis presented here the author has divided the material into sixteen hours, to correspond to a course of four months, but the supervisor can easily expand the time by giving two class hours to the longer subjects.

Since objective teaching is always more successful than that given in lecture, the teacher should have, as far as possible, charts, models, pelves, museum specimens, instruments, and patients for actual demonstration to her pupils.

Desiring not to crowd an already full study hour the author has put in small type those matters which the nurse needs only for reference. In preparing her lesson these paragraphs may be given only passing notice.

J. B. DELEE.

LESSON 1

The function of reproduction is a little circle of big events set into the life of the woman during her period of fertility, that is, from the time of puberty to the menopause (change of life). It is repeated from one to twenty times, rarely oftener. There are 5 parts to each circle; conception, pregnancy, parturition (labor), puerperium, and lactation.

The nurse has to learn about the organs involved in this process, the changes that occur in them as the function is normally performed, and those pathologic influences which render the course abnormal. She must learn the routine care of the mother and baby during pregnancy, labor, puerperium, and lactation, and finally she must be able to recognize accidents and disease and know how to ward them off and cure them.

The present outline of study will follow this broad plan, the subject matter being arranged in 16 lessons.

The first lesson describes the organs concerned in the function of reproduction—the pelvis, the uterus, etc., and the breasts. Then we learn how these organs functionate normally, physiologically, in preparation for the great event—labor.

1. THE BONY PELVIS, p. 25.

- (a) Its 4 bones
- (b) The false pelvis, p. 26.
Its function
- (c) The true pelvis, p. 27.
Its structure
Its shape
The inlet
The outlet
Why rotation of head,
p. 29.
- (d) Varieties of pelvises, p. 30.
Causes of contracted
pelvis
Flat, rachitic
Generally contracted
Flat and generally con-
tracted
Irregularly contracted

2. THE SOFT PARTS, p. 32.

- Name those in pelvis
- (a) The uterus, p. 32.
Its size, shape, parts
How supported
Functions
- (b) The vagina
- (c) The fallopian tubes
- (d) The ovary, p. 35.
Its size and shape
Its functions
- (e) The bladder, ureters, etc.
- (f) The rectum
- (g) The peritoneum, Fig. 14.

3. THE EXTERNAL GENITALS, p. 36.

- (a) The vulva
- (b) The perineum
- (c) The anus, the sphincter

4. THE BREASTS

- (a) Structure
Lobes, acini, ducts
Nipple, areola
Tubercles of Mont-
gomery

THE FUNCTION OF REPRODUCTION

- | | |
|---|--------------------------|
| 1. OVULATION, p. 41. | 2. PUBERTY, p. 42. |
| The functions of the ovary | Definition |
| Its hormone | (a) Physical changes at |
| The corpus luteum | (b) Psychical changes at |
| Time of occurrence, p. 42. | |
| Purpose | |
| 3. MENSTRUATION, p. 44. | 4. CONCEPTION, p. 48. |
| (a) Definition | (a) Definition |
| (b) Local changes in "nest
building," p. 45. | Size of ovum |
| The four stages | Size of spermatozoid |
| (c) Symptoms of | Site of union |
| Relation of corpus lu-
teum to | (b) Time of conception |
| (d) Menstrual anomalies | |
| (e) Menopause | |
| Local changes in | |
| General changes in | |

For further study of the anatomy and physiology of the genital organs the nurse is referred to J. F. Williams, *Anatomy and Physiology for Nurses*, 4th ed., Saunders, 1932, and those nurses who are interested in the development of the ovum may consult Marshall, *Vertebrate Embryology*.

LESSON 2

In this lesson we see the organs perform their masterpiece. First we get a brief glimpse into embryology, and watch the development of the ovum in the uterus. Next we learn how the new little person lives within the womb. Then we study the changes brought about in the mother by the advent of pregnancy—those in the genitalia and those of the rest of the body. Now, the child being ripe, the womb expels it, and the marvelous, soul-stirring, often tragic phenomenon of labor unfolds before our eyes. Finally we observe the return of the organs involved in reproduction, as they go back to their pristine condition.

This assignment is really too long for one hour. It were better if two could be given it, or a demonstration hour added by one of the attending staff.

DEVELOPMENT OF THE OVUM, p. 50.	THE PHYSIOLOGY OF THE FETUS, p. 58.
------------------------------------	--

- | | |
|---|---|
| <ul style="list-style-type: none"> (a) Appearance of ovum at three weeks, Fig. 20. (b) Appearance of ovum at six weeks, Fig. 21. (c) At two months, Fig. 23.
The fetus at each month of pregnancy (d) The protective covering (membranes) (e) Nutritive portion, placenta, p. 50.
The umbilical cord; liquor amnii (f) The fully developed ovum (term), p. 55. (g) The child's head, p. 56.
Sutures, fontanels | <ul style="list-style-type: none"> (a) Metabolism, food, circulation, respiration, excretion (b) The placenta
A teased placenta showing functions of placental villi (c) Evidences of life of fetus in utero |
|---|---|

MATERNAL CHANGES IN PREGNANCY, p. 62.

1. LOCAL CHANGES

What is their object? p. 62.

- (a) The uterus, size, shape
The muscle-fibers
The blood-vessels
The vagina and vulva
- (b) The breasts, p. 63.
Primary areola
Secondary areola
Colostrum
Striæ gravidarum

2. GENERAL CHANGES, p. 64.

What is their object?

- (a) The blood
- (b) The lungs
- (c) The urine
- (d) The skin (striæ, etc.)
- (e) The digestive tract, p. 66.
- (f) The nervous system

3. LABOR, DEFINITION, p. 68.

- (a) Premature labor
- (b) Abortion, miscarriage
- (c) Premonitory symptoms of labor

Lightening, p. 69.

False pains

The show

Rupture of bag of waters

- (d) The three stages of labor, p. 70.

- (e) The powers, passages, passengers

The labor pains, p. 72.

The bag of waters, four functions

Description of labor { 1st stage
2d stage
3d stage

What is rotation of the head?

How does the uterus stop bleeding from the placental sinuses? p. 77.

4. THE PUERPERIUM, p. 77.

Local phenomena

- (a) Changes in uterus, regressive

(b) The lochia { cruenta
sanguinolenta
purulenta
serosa

- (c) Involution, p. 78.

- (d) The uterus

- (e) The lochia

- (f) The breasts, progressive
Colostrum

Formation of milk

General phenomena, p. 82.

- (a) Temperature and pulse

- (b) The loss of weight

(c) The kidneys { polyuria
ischuria
paradoxa

- (d) The bowels

- (e) The skin

- (f) The nervous system

- (g) Let nurse pause a moment and picture the whole phenomenon of the reproductive cycle, reviewing successively its five parts, p. 84.

For further study the nurse is referred to the large obstetric textbooks of J. W. Williams, J. C. Edgar, B. C. Hirst, and the author's own.

LESSON 3

In this lesson we first study the life phenomena of the newborn infant.

Having completed the description of the function of reproduction, as it is normally performed, and having seen the new individual start in life, we now begin the discussion of the relations and duties of the nurse to the pregnant, parturient, and lying-in woman. The multitudinous concerns of the *pregnant* woman are considered—first, the determination that pregnancy exists, next how the gravida should live, eat, dress, bathe, etc., then what preparations should be made for the big coming event, and finally how the nurse should watch over her to prevent accidents and disease.

1. THE NEWBORN INFANT, p. 85.

- | | |
|---|--------------------|
| (a) The adjustments the new-born must make to his environment | (d) Temperature |
| (b) The first respiration and cry | (e) Skin (icterus) |
| (c) Sleep, p. 86. | (f) The navel |
| | (g) The bowels |
| | (h) The kidneys |
| | (i) The weight |

2. THE HYGIENE OF PREGNANCY, p. 90.

- | | |
|---|---|
| Rôle of the nurse as health teacher | Prenatal care, p. 111. |
| | Necessity and objects |
| Mode of living for pregnant woman, p. 91. | (a) Duties of nurse, first visit |
| (a) The woman's dress | (b) Diagnosis of pregnancy |
| (b) Preservation of the figure | Cessation of menses |
| (c) The diet | Morning sickness |
| (d) Sample dietary | Breast signs |
| (e) Food allergy | Quickening |
| (f) Vitamins | Palpation of fetus |
| (g) Exercise | Fetal heart sounds |
| (h) The mind during pregnancy | Aschheim-Zondek test |
| (i) Maternal impressions | Value of each sign |
| (j) Determination of sex | } Presumptive
} Certain |
| (k) The bowels | |
| (l) The kidneys, p. 107 | (c) Diagnosis of time of labor, p. 115. |
| (m) Toxemia | (d) Pelvic measurements, p. 549. |
| (n) Bathing | (e) Blood-pressure, p. 116. |
| (o) Care of genitals, p. 108. | (f) Wassermann test |
| (p) Care of breasts | (g) Urinalysis |
| (q) Engagement of nurse | (h) Labor at home (prep.) |
| | (i) Routine A. P. visit (name 7 points) |

LESSON 4

In this lesson the care of the normal function is continued and the duties of the nurse during *labor* are given in detail.

NURSING CARE IN NORMAL LABOR, p. 135.

- | | |
|---|---|
| <p>1. HOW TO TELL WHEN LABOR BEGINS</p> <p>The show
The pains
Dilatation of cervix
Rupture of membranes</p> <p>2. CARE DURING FIRST STAGE</p> <p>(a) Protective measures
(b) Accidents
(c) Preparation of room
(d) Preparation of bed, p. 140.
(e) Preparation of patient
Discussion of and selection of method (old, iodine, mercurochrome)
(f) Preparation for the doctor, in home
(g) Rectal examination
(h) Vaginal examination
(i) General instructions, p. 152. { Diet
Bowels
and
bladder
Records
Conduct
(j) Preserving asepsis continually
(k) When to summon the doctor, p. 157.
(l) Summary, 6 points</p> | <p>3. CARE DURING SECOND STAGE</p> <p>(a) Accidents, p. 160.
(b) Arrangement of room
(c) Time for "Set up"
(d) Nurse's duties during birth of child, p. 162.
Regarding asepsis
Replenishing supplies
Rectal discharges
Anesthesia
Care of the eyes, mouth, etc.
Cutting cord, p. 169.
Delivery of placenta
Marking, or identification of infant
(e) Summary, 6 points</p> |
|---|---|

LESSON 5

1. CARE OF THIRD STAGE, p. 171.

- (a) Delivery of placenta
- (b) Changing the bed
- (c) Special duties of nurse
 - Guarding the uterus
 - Watching for bleeding
 - Noting patient's pulse, etc.
- (d) Inspection for injuries
- (e) Cleaning up
 - { Patient
 - { Bed
 - { Room
- (f) Perineorrhaphy, p. 175.
- (g) Summary, 7 points

2. FIRST CARE OF CHILD, p. 178.

- (a) Treatment of eyes
- (b) Oiling, or bath
- (c) Dressing cord
- (d) Mouth
- (e) Identification of babies, p. 182.

TECHNIC IN SPECIALIZED MATERNITY, p. 183.

Arrangement of room, dressing of parturient, assignment of duties of nurses in hospital

3. SPECIAL DUTIES OF NURSE, FIRST HOURS, p. 186.

- (a) Watching for hemorrhage
- (b) Position of patient
- (c) Headache—its significance
- (d) Rest, food, sleep
- (e) Condition of child
 - Hemorrhage from cord
 - Choking
- (f) Birth certificate

4. ANESTHESIA IN LABOR, p. 187.

- (a) The various forms of anesthesia
- (b) The mind
- (c) Ether
- (d) Chloroform
- (e) Gas and oxygen, ethylene, p. 191.
- (f) Gwathmey's synergistic method, p. 193.
- (g) Scopolamin-morphin, p. 197.

LESSON 6

In this lesson, which deals with the care of the *puerpera*, we end the discussion of those offices which the nurse owes the woman performing the function of reproduction normally—*physiologically*. *Pathologic* pregnancy, labor, and puerperium will be considered later.

NURSE'S DUTIES DURING THE NORMAL PUERPERIUM, p. 199.

1. IMMEDIATE CARE OF PUERPERA

Freedom of motion

Complications: shock, hemorrhage, eclampsia, infection

2. THE BREASTS

(a) Importance of asepsis

(b) Binder

(c) Care of nipples

(d) Frequency of nursings

3. CARE OF THE GENITALS, p. 204.

(a) Importance of asepsis

(b) The binder

(c) Special care of stitches

(d) Special care of third degree tears

4. GENERAL DUTIES

(a) The history sheet

(b) Diet

(c) Bowels, p. 209.

(d) Bladder { Inducing urination
Catheterization

(e) Sleep, p. 213.

(f) Routine care

Bath

Light and air

Massage and bed exercises

Temperature, pulse, respiration

Complications: infection, late puerperal hemorrhage, pulmonary embolism, mastitis, exhaustion; slow recovery, psychoses, subinvolution

(g) Visitors, p. 217.

(h) The mind

(i) Time of getting up, the first bath, etc., p. 219.

(j) Nursing baby when out of bed

LESSON 7

CARE OF THE NORMAL CHILD, p. 223.

1. IMPORTANCE OF ASEPSIS

In the home

In hospitals { Navel infections
Mouth infections
Skin infections

2. VISITORS

3. THE BATH OR OIL RUB. PREVENTING EPIDEMICS

4. CARE OF THE UMBILICUS

5. CARE OF THE EYES { Nitrate of silver reactions
When to report eyes to doctor

6. THE BOWELS, p. 230.

Meconium

Colonic flushing

Eroded nates

The diaper

7. URINATION

Uric acid deposit

Anuria

8. NURSING, p. 234.

(a) Frequency

(b) Slow learning babies

(c) Water to drink

(d) Pumping the milk

(e) Milking the breast

(f) Weighing before and after

(g) The diet, p. 238.

Starvation fever

Amount of feedings

Special care in regard to syphilis

Artificial foods

9. WEIGHING THE CHILD, p. 240.

10. TEMPERATURE, PULSE, RESPIRATION

11. FRESH AIR

12. TRAINING THE CHILD INTO GOOD HABITS

13. HOW TO CARRY BABY THROUGH CORRIDORS

14. HOME FROM HOSPITAL

LESSON 8

The child does not always present itself for delivery as has been described. Variants, some normal, many abnormal, are shown. Thereupon obstetric operations are described. Some authors place the next two lessons at the end of the course. They are put here so as to give the nurse proper theoretic instruction and foundation for her birthroom duty. She will get much more out of her work in the confinement rooms, and will be of more assistance to the doctors, after having studied the different mechanisms of labor and having learned the technic of the operations. Three hours should be given these lessons—or they should be supplemented by a demonstration by one of the doctors on the staff.

THE PRESENTATIONS AND POSITIONS OF THE CHILD, p. 245.

1. DEFINE Presentation; Position; Point of Direction; Attitude; Engagement
2. THE COMMON PRESENTATIONS
The four or more positions of each one. Give abbreviations.
(The best way to teach these is with a manikin and fetus or doll.)
3. DIAGNOSIS OF PRESENTATION AND POSITION, p. 250.
(a) Ovoid longitudinal or transverse?
(b) What is over inlet?
(c) What is in fundus?
(d) Where is the back?
4. ENGAGEMENT, HOW DETERMINED? p. 254.
5. BREECH CASES, p. 254.
6. SHOULDER PRESENTATION
7. TWINS, p. 256.

OBSTETRIC OPERATIONS, p. 258.

The principles of the preparation for operation, a general understanding of the objects of the various operations, and of the part she is to play in their performance must be learned by the nurse. If each nurse is given the special instruments, into her own hands, she will learn their names, use, and objects better.

1. GENERAL REMARKS ABOUT OBSTETRIC OPERATING

Mortality of obstetric complications

Importance of asepsis

Exposure of patient; disarrangement of sheets, etc.

Surprises and emergencies

Assistance

Home and hospital operations

2. PREPARATION OF ROOM, p. 262.

- (a) Arrangement of furniture
- (b) The table with Kelly pad
- (c) The nurse's side table

3. PREPARATIONS FOR COMPLICATIONS

LESSON 9

1. PREPARATION OF PATIENT, p. 265.

- (a) Asepsis of field of operation
- (b) Position on table

2. INSTRUMENTS. LIGHT. HEAT. ANESTHESIA, p. 268.

3. POSTOPERATIVE CARE, p. 269. MOTHER. CHILD

4. MAJOR OPERATIONS, p. 271.

- (a) The forceps
 - Low. Mid. High (Axis traction)
- (b) Breech extraction, p. 281.
- (c) Version
- (d) Destructive operations

{	Embryotomy
	Craniotomy
	Decapitation, etc.
- (e) Baptism, p. 285.
- (f) Cesarean section, p. 286.
 - In hospital
 - In home
 - Nurse's particular rôle
 - After-care
- (g) Vaginal cesarean section. Duehrssen's incisions, pp. 278, 327.
- (h) Pubiotomy and symphysiotomy, p. 302.

5. MINOR OPERATIONS, p. 306.

- (a) Vaginal examination
- (b) Perineorrhaphy
- (c) Removal of sutures
- (d) Uterine tamponade
- (e) Douches
- (f) Curetage
- (g) Salt solution (hypodermoclysis)
- (h) Blood transfusion
- (i) Induction of premature labor and abortion

LESSON 10

OBSTETRIC COMPLICATIONS

Having now considered the usual course of pregnancy, labor, and the puerperium, and having described the nurse's duties in normal cases, also having given her a general view of the modes of delivery of the child and obstetric operations, let us study the conditions and accidents which may complicate the normal process. The pregnant woman may suffer all those diseases which any woman may have and she is subject also to many peculiar to her condition.

DISORDERS OF PREGNANCY

Compare normal and pathologic pregnancy, noticing particularly how the normal course is disturbed by toxemic conditions (vomiting, eclampsia, etc.), by hemorrhage, which may result from abnormal implantation of the ovum (placenta praevia, ectopic gestation) or interruption of pregnancy (abortion, abruptio placentae), etc.

1. MINOR COMPLAINTS

- (a) Varicose veins, p. 330.
- (b) Leukorrhea
- (c) Pruritus
- (d) Pendulous abdomen
- (e) Pains in abdomen
- (f) Heartburn
- (g) The teeth
- (h) Polyuria
- (i) Fainting
- (j) Nervousness, etc.

2. THE GRAVE CONDITIONS IN PREGNANCY, THE TOXEMIAS

Probable poisons
 Early toxicosis (hyperemesis)
 Late toxicosis (eclampsia)

3. HYPEREMESIS GRAVIDARUM, p. 338.

Symptoms

Causes; four kinds { Organic disease, general
 Organic disease, local
 Neurotic
 Toxemic

Treatment { Mind
 Diet
 Record of total calories and liquids ingested
 Rectal and duodenal feeding
 Prevention of bed-sores

4. PRE-ECLAMPTIC TOXEMIA, p. 344.

5. ECLAMPSIA, p. 345.

Prevention

Treatment by physician

Nursing { Observance of quiet
Prevention of injury

Fresh air

Seven Dont's, p. 354.

Chronic nephritis, p. 356.

6. HEMORRHAGES DURING PREGNANCY, p. 357.

(a) Abortion

(b) Placenta praevia

(c) Abruptio placentae (premature detachment)

(d) Ectopic pregnancy { Definition
Symptoms
Nurse's duties

LESSON 11

COMPLICATIONS DURING LABOR, p. 368.

1. DELIVERY BEFORE THE DOCTOR'S ARRIVAL
 - (a) Restraining labor
 - (b) Protection of perineum

{	Slow delivery Patient on side Head flexed Between pains
---	--
2. DELIVERY OF BREECH CASES
3. PROLAPSE OF CORD
4. ACUTE DELIRIOUS MANIA, p. 378.
5. HEMORRHAGE
 - (a) During labor
 - (b) Rupture of uterus, p. 379.
 - Symptoms of threatened
 - Symptoms of actual
 - (c) After labor

{	Symptoms Treatment during P. P. H. After-care
---	---
6. GENERAL MEDICAL AND SURGICAL COMPLICATIONS IN LABOR

Heart disease, tuberculosis, appendicitis, septic infection, gonorrhea, syphilis, acute exanthemata, typhoid, etc.

Since these subjects are not discussed in the text, the instructress may use this opportunity to expand on them, giving symptoms and special nursing care, as required by each, with reference to the progress of labor.

LESSON 12

COMPLICATIONS OF THE PUERPERIUM, p. 387.

What may disturb a normal puerperium? Any disease which a person may have, also many disorders of the puerperal processes themselves. Toxemia and hemorrhage may occur, but infection is the most common and dangerous complication.

1. PUERPERAL INFECTION
 - (a) Definition
 - (b) History
 - (c) Sources of the germs

(d) Prevention, two principles { Prevent injury
Prevent infection of wounds

(e) Personal care of nurse

(f) Symptoms, p. 394.

(g) Treatment, p. 395.

General nursing care. This resembles that of a typhoid
plus that of an open surgical wound

Nourishment; nurse does three things

Rectal infusion

Medicines

Surgical treatment, douches, operations, etc.

(h) Mental treatment

(i) Advice to the nurse

(j) What to do with the child

(k) Limitation of infection, p. 405.

2. PUERPERAL THROMBOSIS, p. 407.

Definition

Embolism

Phlegmasia alba dolens

Causes, treatment

3. MINOR COMPLICATIONS, p. 408.

After-pains

Tympany

Constipation

4. VESICOVAGINAL FISTULA, p. 411.

(a) Permanent catheter

(b) Cystitis, p. 413.

(c) Collecting sterile urine

Catheter

Two-basin method

5. HEADACHE, p. 414.

6. SUBINVOLUTION, p. 415.

7. DISEASES OF MIND, p. 415.

Nervous breakdown

Insanity

LESSON 13

COMPLICATIONS OF THE PUERPERIUM—BREASTS

1. ENGORGEMENT, p. 419.

- (a) Symptoms
- (b) Differentiate from mastitis
- (c) Treatment

2. VARIETIES OF NIPPLES, p. 424.

3. CRACKS, FISSURES, ETC., p. 425.

- (a) Causes
- (b) Treatment {
 - Importance of asepsis
 - Medical applications
 - Shields
 - Rest

4. MASTITIS, p. 429.

- (a) Causes
- (b) Symptoms
- (c) Treatment {
 - Rest
 - Binder
 - Catharsis
 - Ice-bags
 - Bier's method
- (d) Preparation for operation on abscess

5. EXCESS OF MILK

6. AGALACTIA, p. 436.

- (a) Causes
- (b) Symptoms {
 - Baby
 - Mother
 - Diet
- (c) Treatment {
 - Massage
 - Medicines

7. ABNORMAL MILK, p. 440.

8. WEANING

9. CARE OF WET-NURSE

LESSON 14

DISORDERS OF THE FIRST WEEKS OF LIFE, p. 443.

1. AFFECTIONS OF THE DIGESTIVE SYSTEM, p. 443.

- (a) Indigestion
- (b) Colic
- (c) Difficulty of nursing
- (d) Vomiting
- (e) Diarrhea
- (f) Green stools
- (g) Inanition fever
- (h) Thrush
- (i) Bednar's aphthae
- (j) Marasmus

2. AFFECTIONS OF THE RESPIRATORY ORGANS, p. 451.

- (a) Snuffles
- (b) Bronchitis, pneumonia
- (c) Cyanosis, atelectasis, pp. 452 and 508.

3. AFFECTIONS OF THE URINARY ORGANS, p. 453.

- (a) Retention of urine
- (b) Uric acid
- (c) Phimosis and circumcision

4. AFFECTIONS OF THE SKIN, p. 458.

- (a) Jaundice
- (b) Eruptions
 - Vesicles
 - Chafing
 - Pemphigus or impetigo

LESSON 15

1. SUNDRY MILD DISORDERS, p. 462.

- (a) Engorgement of breasts
- (b) Vulvitis
- (c) Menstruation
- (d) Retained cord and sarcomphalus

2. INFECTIONS OF THE NEWBORN, p. 463.

- (a) General instructions to nurse
- (b) Infection of the navel
- (c) Ophthalmia neonatorum

{	Symptoms
{	Prevention
{	Treatment

(d) Pharyngitis, p. 469.

(e) Pyelitis

3. HEMORRHAGES OF THE NEWBORN, p. 470.

4. OPERATIVE INJURIES

(a) External wounds, fractures, paralyses

(b) Internal—brain, liver, etc.

(c) Caput succedaneum and cephalhematoma

5. CONGENITAL DEFORMITIES, p. 475.

(a) Monstrosities—what to do

(b) Hare-lip, occlusion of anus, hernia

6. SUNDRY SERIOUS DISORDERS

(a) Convulsions.	Causes	{	Brain injury	
			Toxemia.	Atelectasis
			Tetanus.	Meningitis

(b) Tetanus

(c) Hot-water bags

(d) Overlying child

(e) Asphyxia neonatorum

Livida

Pallida

Treatment

LESSON 16

CARE OF PREMATURE INFANTS, p. 485.

1. DESCRIBE A PREMATURE INFANT

- | | | |
|-----------------------------------|---|--|
| (a) Weakness of natural functions | { | Lungs
Cry, appetite
Bowels
Urine, temperature |
|-----------------------------------|---|--|

2. THE INCUBATOR

- (a) Varieties
- (b) Care of
- (c) Ventilation of, p. 494.
- (d) Incubator baby's dress

3. GENERAL CARE. Five salient features

4. THE DRESS

- | | | |
|------------------|---|---------------------------------------|
| 5. DIET, p. 498. | { | Food
Amounts
Methods of feeding |
|------------------|---|---------------------------------------|

6. THE BATH, p. 504.

7. CARE OF EYES, NOSE, AND MOUTH

8. GENERAL CARE AND REMOVAL FROM INCUBATOR

9. PARTICULAR DISEASES OF PREMATURE INFANTS, p. 507.

- (a) Bronchitis and pneumonia
- (b) Sprue
- (c) Nasal infection
- (d) Cyanosis, atelectasis
- (e) Convulsions

INFANT FEEDING, p. 512.

1. MILK AS A FOOD.

Fats, proteins
 Carbohydrates
 Salts

2. BREAST MILK THE IDEAL

3. CONTRAINDICATIONS TO MATERNAL NURSING

4. VARIATIONS IN MILK QUANTITIES

Breast activity
 Quantity of milk in breast
 Factors influencing breast milk

5. DURATION AND FREQUENCY OF FEEDINGS

Overfeeding

Underfeeding

6. ARTIFICIAL FEEDING, p. 521.

Human and cows' milk compared

7. HOW TO WRITE FORMULAS

8. HOW TO PREPARE FOODS

The bottle and nipple

How to feed baby

9. SPECIAL KINDS OF MILK, p. 529.

Certified

Protein milk

Pasteurized

Dried

Buttermilk

Condensed

Lactic acid milk

Liebig, etc.

10. VITAMINS

INDEX

- ABDOMEN, pains in, in pregnancy, 334
 pendulous, in pregnancy, 334
 Abdominal binders, 124
 postpartum, 175, 221
 examination, preparation of patient for, 148
 supporter in pregnancy, 93
 Ablactation, 441
 Abnormal milk, 440
 Abnormalities of nipple, 424
 Abortion, 68, 357
 causes of, 357
 criminal, 326
 in progress, 357
 incomplete, 357
 malformations of fetus in, 358
 missed, 357
 prenatal care and, 358
 septic, 357
 symptoms, 357
 therapeutic, 326
 in hyperemesis gravidarum, 343
 threatened, 357
 treatment of, instruments for, 324
 Abruptio placentae, 70, 362
 Abscess of breast, operation for, 433
 submammary, 430
 Absolute milk diet, 590
 Abt's electric breast-pump, 438
 Accidental hemorrhage in pregnancy, 362
 Accidents in hospitals, prevention of, 546
 Acetylene anesthesia, 193
 Acid, boric, solution of, preparation of, 579
 carbolic, solution of, preparation of, 577
 Acid, lactic, milk, 530, 531
 milk digested with, 594
 uric, in urine of newborn, 89, 233, 454
 Acidosis in pregnancy, 100
 Acini of breast, 39
 Acriflavin compound, 325, 577
 Adhesive corset after cesarean section, 300
 plaster for varicose veins, 331
 Administration of chloroform in second stage of labor, 190
 of ether in second stage of labor, 168, 189
 of salt solution, 313
 After-birth. See *Placenta*.
 pains, 77, 79, 173, 408
 Agalactia, 436
 Bier's treatment, 438
 causes of, 436
 cool bath in, 437
 liquid diet in, 437
 malt preparations in, 437
 massage of breasts in, 438
 symptoms of, 436
 treatment, 437
 Ahlfeld's method of sterilization of hands, 559
 Air, fresh, for infant, 241
 in eclampsia, 352
 in pregnancy, 101
 pessary, 320
 Air-embolism in third stage of labor, 175
 Albumen-water, 591
 Albumin milk, 531
 Alcohol and hot water method of sterilization of hands, 559
 in pregnancy, 96
 Allergy, food, in pregnancy, 100
 Ambulance, incubator, 492, 493
 Amniotic fluid, 51

- Analgesia, Gwathmey's synergistic, 193
 administration of, 194-197
 contraindications to, 193
 preparation of, 193
 scopolamin-morphin, 197
 Analgesics, newer, 197
 Anatomy of generative organs, 25
 Anemia in premature infants, 507
 Anemoscope, 490
 Anesthesia à la reine, 187
 acetylene, 193
 chloroform, for operations, 269
 in labor, 190
 ether, for operations, 269
 in labor, 168, 189
 ethylene, in labor, 192
 for cesarean section, 292
 for operations, 269
 in labor, 187
 in second stage of labor, 168, 189
 local, 198
 nitrous oxid and oxygen, in labor, 191
 Ankyloglossia, 476
 Anterior fontanel, 56
 Antiseptic solutions, preparation of, 576
 Antiseptics in preparation for labor, 146
 Anus, 36, 38
 imperforate, 475
 occlusion of, 475
 Aorta compressor, Sehrt's, 384
 Apartments, sterilization of, 575
 Aphthae, Bednar's, in infant, 448
 Appetite in pregnancy, 67
 Applicators, 126
 Aprons, sterilization of, 574
 Areola of nipple, 40
 secondary, 63
 Areolar signs in pregnancy, 114
 Argyrol for prevention of ophthalmia neonatorum, 179
 Arm, Erb's paralysis of, 472
 Arrest, deep transverse, 278
 Arsenical poisoning, 589
 Articles needed by obstetric nurse, 584
 for obstetric cases, 122
 Artificial feeding, 521
 respiration, Byrd's method, 483
 Sylvester's method, 482
 Aschheim-Zondek test for pregnancy, 115
 urine for, 119
 Asepsis during labor, 135
 preservation of, 153
 in care of infant, 223
 of breasts during puerperium, 394
 of nurse, 20
 during labor and puerperium, 393
 of obstetric nurse following infectious cases, 136
 Asepto syringe, 322
 Asphyxia livida, 480
 neonatorum, 479
 preparation for, 264
 treatment, 480
 pallida, 480
 Aspirator pump for use at cesarean section, 290
 Assistants at operation, necessity for, 261
 Atelectasis pulmonum in newborn, 86, 180, 452
 in premature infant, 486, 510
 Atony of uterus, postpartum hemorrhage due to, 380
 Attitude, 248
 Auto-infection, 391
 Auvard incubator, 488
 Avertin, 197
 Avoirdupois-metric chart for babies, 601
 Axis traction forceps, 274
 BACKACHE in pregnancy, 336
 Bag, labor visiting, 537
 method of inducing premature labor, 34
 of waters, 73
 functions of, 73
 rupture of, as sign of labor, 70
 postpartum visiting, 543
 Balloon dilators, varieties of, 320
 method of inducing premature labor, 321
 Bands, knit, infant, 130
 Baptism of infant, 285
 Barley, Robinson's patent, 532
 water, 533, 591
 Barnes' dilator, 320

- Barton's forceps, 273
 Basins, sterilization of, 573
 Bath, cool, in agalactia, 437
 in pneumonia in infant, 451
 of premature infant, 504
 temperature of, for infant, 227
 Bathing in pregnancy, 108
 of infant, 224
 Bath-tub for infant, 133
 Baudelocque's diameter, taking, 553
 Bearing down during second stage of labor, 167
 pains, 72
 Bed exercise in puerperium, 214, 216
 getting up from, after labor, 219
 incubator, 495
 infant's, 132
 preparation of, for first stage of labor, 140
 sterilization of, 574
 symphysiotomy, 305
 Bed-frame, symphysiotomy, 304
 Bednar's aphthae in infant, 448
 Bed-pans, sterilization of, 573
 Bedsores in puerperal infection, prevention of, 396
 Beef-juice, 592
 Beef-tea, 592
 with acid, 592
 Bichlorid of mercury solution, preparation of, 577
 Bier's congestion treatment of mastitis, 435
 treatment of agalactia, 438
 Binders, abdominal, 124
 postpartum, 175, 221
 breast-, 124, 202, 420
 infant's, 130
 Birth, certificate of, 187
 cross, 256
 Bladder, 35
 full, during labor, 152, 155
 in puerperium, 211
 inflammation of, in pregnancy, 336
 in puerperium, 413
 lavage of, 413
 Blankets, infant's, 132
 Bleeder, 470
 Bleeding, 321
 Blindness, prevention of, in newborn infant, 179, 466
 Blisters of nipple, 425
 Blood in pregnancy, 65
 obtaining, for Wassermann test, 117, 118
 of fetus, 60
 transfusion, direct method, 319
 in hemorrhagic diathesis, 319
 in melena, 319
 indirect method, 319
 preparations for, 318
 Blood-pressure, taking, in pregnancy, 116
 Blue babies, 452, 510
 spells in premature infant, 509
 Board, circumcision, 455, 457
 Bobbin, linen, for tying cord, 573
 Bohn's nodules, 449
 Bone forceps, Mesnard-Stein, 284
 Bones, innominate, 27
 parietal, 56
 Bony pelvis, 25
 Booties, 132
 Borborygmus, 86
 in infant, 231
 Boric acid solution, preparation of, 579
 Bottle, nursing, 527
 ancient, 534
 for premature infant, 500
 hygienic, 533
 Bougie, 320
 Bowels in first stage of labor, 152
 in pregnancy, 105
 in puerperal infection, 396
 in puerperium, 83, 209, 410
 of infant, care of, 230
 of newborn, 87
 rumbling in, in newborn infant, 86
 Boxes, maternity, 126
 Brain, injuries of, in birth, 473
 Braun's colpeurynter, 320
 decapitation, hook, 284
 Braxton-Hicks' sign of pregnancy, 115
 version, 282
 Breakdown, nervous, in puerperium, 415
 Breast, 39
 abscess of, operation for, 433
 acini of, 39
 activity of, 516
 anatomy of, 39

- Breast, asepsis of, during puerperium, 394
 caked, 420
 care of, after patient is up, 221
 during puerperium, 201
 draining of, for abscess, 433
 drying up, 441
 engorgement of, in puerperium, 419
 massage in, 421-423
 symptoms, 419
 treatment, 420
 enlargement of, as sign of pregnancy, 114
 in newborn, 462
 treatment, 462
 excess of milk in, 435
 feeding. See *Infant, nursing of*.
 in pregnancy, 63
 care of, 110
 support for, 93
 in puerperium, 81
 care of, 201
 diseases of, 419
 infections, diagram of, 432
 inflammation of, 429
 lobes of, 39, 40
 massage of, in agalactia, 438
 in engorgement, 421-423
 milk, amount of feedings, 517
 chemical examination of, 521
 compared with cow's milk, 522
 factors which influence, 517
 ideal food for infants, 515
 quantity of, 517
 milking of, 236
 putting newborn infant to, 203
 time for, 234
 right, expressing milk from, 236
 scarcity of milk in, 436
 stimulation of, to increase milk, 240
 Breast-binder, 124, 202, 420
 Breast-pump, Abt's, 438
 Breech extraction, 281
 presentation, 246, 248, 254, 281
 before doctor's arrival, 375
 positions of, 248
 Wiegand-Martin method in, 255
 Brim of pelvis, 28
 Broad ligaments, 35
 Bronchitis in infant, 451
 Brophy's nipple for babies with cleft palate, 475
 Broth, chicken, 592
 clam, 592
 mutton, 594
 Brow presentation, 246
 Brushes, sterilization of, 555
 Buttermilk, 530
 Buttocks of infant, care of, 232
 sore, electric lamp for, 449
 of infant, 449
 Byrd's method of artificial respiration, 483
 CAKED breast, 420
 Caput succedaneum, 474
 Carbohydrate in milk, 514
 Carbolic acid solution, preparation of, 577
 Care after operations, 269
 during labor, 135
 during puerperium, 199
 of wet nurse, 441
 prenatal, 111
 Carrying infant, 242, 243
 Cascara sagrada, administration of, in puerperium, 210
 in constipation of pregnancy, 107
 Casein in milk, 513
 Castor oil, administration of, in puerperium, 210
 to infant, 230
 Catgut, sterilization of, 570
 Catheter, mushroom, 413
 permanent, after vesicovaginal fistula operations, 412
 tracheal, 480
 Catheterization, postpartum, 212
 Catheterized urine specimen for culture, 414
 Caul, 73
 Cellophane, 566
 Cellulitis, periglandular, 429
 Cephalhematoma, 474
 Cephalic version, 282
 Cephalotribe, 284
 Cephalotripsy, 285
 Cereal extract, 592
 foods in infant feeding, 529
 Cereals, 524
 Certificate of birth, 187
 Certified milk, 529

- Certified milk, vitamin D, 530
 Cervix, 34
 Duchrssen's incisions of, 278, 279, 329
 in pregnancy, 63
 Cesarcian section, 286
 adhesive corset after, 300
 after-care, 296
 arrangement of room for, 289
 aspirator pump for use at, 290
 assistants needed for, 291
 conservative, 294
 convalescence, 300
 disinfection of skin for, 290
 elective, 287
 in ancient Italy, 286, 287
 indications for, 286
 instruments for, 292
 light, heat, and anesthetic for, 292
 low cervical extraperitoneal, 295
 intraperitoneal, 294, 295
 newer, 294
 preparation for, 288
 in home, 288
 steps of, 286, 294
 supplies for, hospital, 291
 technic of, 292
 vaginal, 301
 Chadwick's sign of pregnancy, 115
 Chafe, 232, 460
 treatment, 460
 Chairs, sterilization of, 574
 Chamberlen's forceps, 272
 Champagne whey, 592
 Champetier de Ribes' bag, 320
 Change of life, 47
 Chart, avoirdupois-metric, for babies, 601
 Chemical examination of breast milk, 521
 Chicago Lying-in Hospital, diet table at, 498
 drums, 579
 incubator station, 489
 labor satchel, 538
 method of identifying newborn infants, 182
 postpartum satchel, 542
 Chicken broth, 592
 Child bearing, best time for, 44
 care of, 223
 sex differences in, 42
 Child, stone, 357, 364
 Childbirth. See *Labor*.
 Chloroform, administration of, in second stage of labor, 190
 anesthesia for operations, 269
 Queen's, 187
 Chorionic villi, 59
 Circumcision, 454
 board, 455, 457
 preparations for, 455, 456
 Clam broth, 592
 Cleft palate, 475
 nipple for babies with, 475
 Climacteric, 47
 Clitoris, 37
 Clothes-basket as incubator, 487, 488
 Coccyx, 26
 Coffee, nutritious, 594
 Cold process peptonized milk, 594
 Colds in infant, 451
 Colic in infant, 444
 treatment of, 444
 intestinal, mistaken for labor pains, 135
 Collapse in labor, 265
 Colonic flushing for infant, 231
 Colostrum, 63, 81
 Colpeurynter, Braun's, 320
 filling with piston syringe, 322
 in treatment of placenta praevia, 361
 instruments for filling, 322
 Commissure, posterior, 38
 Complementary feeding, 520
 Complications during labor, 368
 obstetric, 329
 of puerperium, 387
 Compressor, Sehrt's aorta, 384
 Conception, 48
 time of, 49
 Condensed milk, 532
 Confinement jacket, 125
 time of, diagnosis, 115
 Conflicts, mental, in young mother, 217
 Congenital deformities in newborn infant, 475
 Congestion treatment of mastitis, 435
 Conjugata diagonalis, taking, 554
 Conjunctivitis in infant, treatment of, 230
 Constipation in infant, 445

- Constipation in pregnancy, 67
 diet in, 106
 drugs in, 106
 oil enema for, 106
 psychotherapy, 106
 treatment, 105
 in puerperium, 83, 209, 410
 Contagion in syphilis, prevention of, 589
 Continuous intravenous treatment, 600
 Contracted pelvis, 31
 Convalescence after cesarean section, 300
 Conveniences, nursery, 132
 Convulsions in eclampsia of pregnancy, 345
 in infants, 477
 causes of, 477
 in premature infant, 510
 Cord. See *Umbilical cord*.
 Coronary suture, 56
 Corpus luteum, 42
 function of, 42
 Corset, adhesive, after cesarean section, 300
 in pregnancy, 91, 93
 Coryza in infant, 451
 Cotton-wrapped toothpicks, 126
 Couveuse, 488. See also *Incubator*.
 Covered sponges, 564, 565
 Covers, toilet seat, 109
 Cracks of nipple, 425
 dry air treatment, 427
 remedies for, 429
 therapeutic lamp treatment, 428, 429
 Cramp in leg during labor, 160, 161
 Cranioclasia, 285
 Cranioclast, Zweifel, 284
 Craniotomy, 285
 Crease, genital, 36
 Credè's method for prevention of ophthalmia neonatorum, 179
 Creolin solution, preparation of, 578
 Criminal abortion, 326
 Cross birth, 256
 Cry of newborn infant, 86
 Curd tension, 513
 Cure, meat, 593
 Curetage, instruments for, 324
 uterine, 312
 Cutting umbilical cord, 373, 374
 Cyanosis in newborn, 452
 in premature infant, 509
 Cystitis in pregnancy, 336
 in puerperium, 413
 Cystoscopes, sterilization of, 563
 Cystoscopy, preparation for, 414
 DAVIDSON'S bulb syringe, 322
 Deaths from childbirth, 17
 Decapitation, 284
 hook, Braun, 284
 scissors, 284
 Decidua in lochia, 80
 Decubitus, prevention of, in hyperemesis gravidarum, 344
 Deformed pelvis, causes of, 30
 Deformities, congenital, in newborn infant, 475
 Delayed separation of cord, 463
 urination in newborn, 453
 DeLee's hypodermoclysis needle, 314
 method of breast massage in engorgement, 420
 of sterilizing rubber gloves, 560
 of treating cord, 170
 shoulder hook, 284
 treatment of cracked nipples, 426
 uterine packing forceps, 309
 Delirious mania in labor, 378
 Delivery, abdominal, 286
 before doctor's arrival, 368
 forceps, 271
 normal, 68, 135
 operative, 258
 Deportment of nurse, 585
 De Ribes' inelastic bag, 320
 Destitute, labor among, care during, 537
 Destructive operations, 283
 Detachment, premature, of placenta, 362
 Determination of sex, 104
 Development of infant, 535
 Diameter, Baudelocque's, taking, 553
 interspinous, taking, 551
 sacropubic, taking, 555
 Diapers, 132, 233
 of premature infant, 505
 Diaphoresis in eclampsia, 352

- Diarrhea in infant, 446
 Diathesis, hemorrhagic, blood
 transfusion in, 319
 Dichorionic twins, 257
 Diet after perineorrhaphy, 206
 for prevention of overgrowth in
 child, 591
 in constipation of pregnancy, 106
 in eclampsia, 354
 in first stage of labor, 152
 in hyperemesis gravidarum, 341
 in incubator, 498
 in pregnancy, 95
 suggestions, 97
 in puerperal infection, 397
 in puerperium, 207
 liquid, 590
 in agalactia, 437
 meat, raw, 593
 milk, 590
 non-protein, 591
 of infant, 238
 additions to, 528
 of premature infant, 498
 of wet-nurse, 442
 pre-eclamptic, 591
 semisolid, 591
 table used at Chicago Lying-in
 Hospital, 498
 Dictary, 590
 Diets, list of, 590
 Digestive organs of infant, affec-
 tions of, 443
 tract in pregnancy, 66
 Digital examination, preparation
 for, 306
 Dilatation of prepuce in infant,
 457
 period of, in labor, 70
 Dilators, balloon, varieties of, 320
 Hegar's, 325
 Dip for premature infant, 505
 Diplococcus of Neisser, 465
 Direction, point of, 246
 Disinfection after puerperal infec-
 tion, 405
 of skin for cesarean section, 290
 Disorders of pregnancy, 329
 Doctor, delivery before arrival of,
 368
 preparation for, in first stage of
 labor, 147
 when to summon, at labor, 157
 Douche, 311
 uterine, 312
 vaginal, 311
 arrangement for giving, 402
 in postpartum hemorrhage,
 382, 383
 Douche-cans, sterilization of, 573
 Draining of breast for abscess, 433
 Dress in pregnancy, 91
 infant's, 131
 nurse's, 585
 of premature infant, 496
 Dresser arranged as supply table,
 164
 Dressing forceps of nurse, 584
 table for nursery, 133
 Dressings, sterilization of, 564
 vulvar, 566
 Dried milks, 532
 Drinking glass for patient in
 horizontal position, 342
 Drop method of giving salt solu-
 tion by rectum, 399
 Dropper, feeding, for premature
 infant, 500
 Dropping as sign of labor, 70
 Drums at Chicago Lying-in Hos-
 pital, contents of, 579
 Dry air treatment of cracked
 nipples, 427
 heat, sterilization by, 562
 labor, 70
 Drying up the milk, 441
 Duchenne-Erb's paralysis, 472
 Duehrssen's dilator, 320
 incisions, 278, 279, 327
 Dumbbell, rectal, 409
 Duncan's mechanism, 77
 Duodenal feeding, 597
 apparatus for, 598
 Dystocia, 112
 EARLY expression, 173
 Eclampsia in pregnancy, 338, 345
 convalescence from, 355
 convulsions in, 345
 diaphoresis in, 352
 diet in, 354
 "dont's" in treatment of, 354
 French treatment, 347
 fresh air in, 352
 general nursing in, 348
 nephritis and, 356
 on guard in, 354

- Eclampsia in pregnancy, prenatal
 care and, 338
 Stroganoff's treatment, 347
 symptoms, 345
 tongue injuries in, preven-
 tion of, 349
 treatment, 346
 curative, 347
 preventive, 346
 venesection in, 321
 Eclampsism, 345
 Economy in hospital nursing, 548
 Ectopic gestation, 360. See also
 Extra-uterine pregnancy.
 Eczema intertrigo in infants, 460
 treatment, 460
 Edema of extremities in preg-
 nancy, 330
 Egg and milk, 594
 lemonade, 592
 Eggnog, 592
 Eggs in infant feeding, 529
 Egg-water, 591
 Egypt, ancient, labor in, 184
 Eiweiss milk, 531
 Electric arc lamp for fumigation,
 576
 breast-pump, Abt's, 438
 incubator, Hess, 503
 lamp for sore buttocks, 449
 pads, 479
 Elevated Sims' position, 377
 Embolism, puerperal, 407
 Embryos, early human, 52
 Embryotomy, 283, 285
 indications for, 283
 instruments for, 284
 Emotions in pregnancy, 102
 in young mother, 217
 Enema in puerperium, 210
 oil, in pregnancy, 106
 ox-gall, 410
 Engagement of nurse, 110
 of presenting part, 254
 Engorgement of breast in puerpe-
 rium, 419
 massage in, 421-423
 symptoms, 419
 treatment, 420
 Enlargement of breasts in new-
 born, 462
 treatment, 462
 Epidemics, preventing, among in-
 fants, 228
 Episiotomy, 75
 Erb's paralysis, 472
 Ergosterol, 535
 Ergot in third stage of labor, 174
 Eruptions on skin in newborn, 458
 vesicular, in infants, 459
 Erythema in infants, 459
 Ether, administration of, during
 second stage of labor, 168,
 189
 open and closed methods, 188
 anesthesia for operations, 269
 Ethylene anesthesia in labor, 192
 Evaporated milk, 531
 Examination, obstetric, prepara-
 tion for, 148, 306
 of patient, first, 113
 Excess of milk in breast, 435
 Exercise in bed in puerperium,
 214, 216
 in pregnancy, 100
 Exhaustion in labor, prevention
 of, 137
 Expressing milk from mother's
 breast, 236
 Expression, early, 173
 Expulsion, period of, in labor, 71
 External examination, preparation
 of patient for, 148
 genitals, 36
 restitution, 75
 Extract, cereal, 592
 Extraction, breech, 281
 Extraperitoneal cesarean section,
 295
 Extra-uterine pregnancy, 363
 after-care, 367
 causes of, 365
 duties of nurse in, 366
 symptoms of, 366
 Extremities, edema of, in preg-
 nancy, 330
 Eyes, irrigation of, in ophthalmia
 neonatorum, 468, 469
 of newborn infant, care of, 168,
 229
 infection of, 465
 sore, 229, 465
 of premature infant, care of, 505
 FACE presentation, 246, 248
 Facial paralysis after forceps de-
 livery, 471

- Facial spasm, 478
 Fainting in pregnancy, 336
 Fallopian tubes, 34
 False pains of labor, 70, 135
 pelvis, 26, 27
 Farinaceous foods, 532
 Fats in milk, 513
 Fear in pregnancy, 102
 Feces, hardened, removal of, 410
 Fecundation, 48
 Feeding dropper for premature
 infant, 500
 duodenal, 597
 apparatus for, 598
 infant, 512. See also *Infant
 feeding.*
 nasal, 599
 ensemble, 599
 premature infant, 501
 rectal, 595
 through skin, 596
 Feeling life as sign of pregnancy,
 114
 Feet, keeping warm in incubator,
 497
 Femoral hernia in infants, 476
 Fertility, 256
 Fertilization, 48
 Fetal heart tones as sign of preg-
 nancy, 114
 sex and, 104
 Fetus at term, 55
 at two months, 53
 blood of, 60
 development of, 52
 head of, 56
 hiccup of, 61
 liver of, 60
 malformations of, in abortions,
 358
 metabolism of, 58
 movement of, 61
 mutilating operations on, 283
 nourishment of, 59
 palpation of, in diagnosis of
 pregnancy, 114
 physiology of, in uterus, 58
 position of, in uterus, 57
 weight increase, chart showing,
 54
 Fever in infant, 238
 inanition, in newborn, 447
 puerperal, 387
 starvation, 478
 Figure, preservation of, in preg-
 nancy, 94
 Fimbriae, 34
 Fissures of nipple, 425
 Fistula, rectovaginal, in puer-
 perium, 411
 vesicovaginal, in puerperium,
 411
 Flat pelvis, 31
 Flaxseed tea, 593
 Flooding, 380
 Flour-ball, 593
 Fold, genital, 36
 Follicle, graafian, 41
 Fontanel, 56
 anterior or large, 56
 posterior or small, 56
 Food allergy in pregnancy, 100
 Foods, farinaceous, 532
 Liebig, 532
 malted, 532
 milk, 532
 Foot-print records of infant, 181
 Forceps, axis traction, 274
 Barton's, 273
 Chamberlen's, 272
 DeLee's uterine packing, 309
 dressing, of nurse, 584
 Kielland's, 273
 Mesnard-Stein bone, 284
 Milne-Murray's, 274
 operation, 271
 duties of nurse during, 280
 facial paralysis after, 471
 high, 273
 indications for, 274
 injuries to infant in, 470
 instruments for, 277, 279
 low, 273
 mid-forceps, 273
 Waleher position for, 280
 Palfyn's, 272
 Simpson's, 273
 Tarnier's, 274
 varieties of, 273
 Zweifel's, 274
 Formaldehyd lamps for fumiga-
 tion, 575
 vapor, generation of, 575
 Formalin solution, preparation of,
 578
 Formula, milk, preparation of, 526
 rules for writing, 524
 Fossa navicularis, 38

- Fourchet, 38
 Freiburg's analgesia, 197
 French treatment of eclampsia, 347
 Fresh air for infant, 241
 in eclampsia, 352
 in pregnancy, 101
 Fright during pregnancy, 103, 104
 Frontal suture, 56
 Full term, 51, 55
 Fumigation, 575
 Fundus of uterus, 34
 Funis, 51
 Fürbringer's method of sterilization of hands, 558
 Furniture, sterilization of, 574
- GALACTORRHEA, 435
 Gauze for uterine tamponade, 569
 gelatin, 570
 in uterus for induction of labor, 321
 iodoform, 568
 lysol, for tamponade, 566
 packer, tubular, 323
 packing uterus with, 308
 plain sterilized, 567
 Gavage, Tarnier's method of, for premature infant, 501
 Gelatin gauze, 570
 Generative organs, anatomy of, 25
 changes in, in puberty, 44
 physiology, 41
 Genital crease, 36
 Genitals, care of, during pregnancy, 108
 during puerperium, 204
 changes in, in pregnancy, 62
 external, 36
 preparation of, for first stage of labor, 142
 Gentian violet in thrush, 448
 Germ, gonorrhea, 465, 587
 Gestation, ectopic, 363. See also *Extra-uterine pregnancy*.
 Getting up after labor, time of, 219
 Gigli wire saw, 302, 304
 Glandular mastitis, 429
 Glass, drinking, for patient in horizontal position, 342
 nipple-shield, 235
 urinal, 453
 Gloves, rubber, sterilization of, 559
- Gloves, rubber, sterilization of, DeLee's method, 560
 Glucose, intravenous administration of, 318
 Goat's milk, 533
 Gonococcus of Neisser, 465, 587
 Gonorrhea, 587
 germ, 465, 587
 symptoms of, 587
 treatment of, 587
 Goodell's sign of pregnancy, 115
 Gossip about cases, avoidance of, 586
 Gown drum, contents of, 581
 Gowns, sterilization of, 574
 Graafian follicle, 41
 Grams, to change to pounds, 601
 Granulations of navel, 463
 Granum, imperial, 532
 Green stools in infant, 447
 Growth of infant, 535
 Guarding uterus in third stage of labor, 171, 172
 Gum, red, 459
 white, 459
 Gum-acacia-glucose solution, 318
 Gum-arabic water, 593
 Gwathmey's synergistic analgesia, 193
 administration of, 194-196
 contraindications to, 193
 preparation of, 193
- HANDS, sterilization of, 558
 Ahlfeld's method, 559
 Fürbringer's method, 558
 usual method, 559
 spasm of, 478
 Hangnails, infected, in newborn, 459
 Harelip, 475
 nipple for use with, 475
 Harrison prescriptions, 596
 Head, advancement of, in first stage of labor, 157, 158, 159
 after-coming, Wiegand-Martin method of delivering, 255
 of fetus, 56
 at term, 57
 of newborn infant, molding of, 57
 Headache during and after labor, 186

- Headache in puerperium, 414
 Health teacher, nurse as, 18
 Heart tones, fetal, as sign of pregnancy, 114
 sex and, 104
 Heartburn in pregnancy, 335
 Heat and light in operating room, 268
 for cesarean section, 292
 dry, sterilization by, 562
 prickly, 459
 treatment, 460
 Heating of incubator, 488
 Hebostectomy, 302
 Hegar's dilators, 325
 sign of pregnancy, 115
 Hemorrhage, accidental, in pregnancy, 362
 during labor, 379
 during pregnancy, 357
 in newborn, 470
 in placenta praevia, 359
 in third stage of labor, 173
 postpartum, 380
 after-care, 385
 causes of, 380
 duties of nurse, 381
 preparation for, 264
 Schrt's aorta compressor in, 384
 symptoms of, 380
 treatment, 381-385
 Hemorrhagic diathesis, blood transfusion in, 319
 Hemorrhoids, 39
 Hernia, femoral, 476
 in newborn infant, 476
 inguinal, 476
 umbilical, 476
 Hess electric incubator, 503
 Hexenmilch, 462
 Hiccup of fetus, 61
 High stomach, 94
 prevention of, 94
 Hirst's dilator, 320
 History sheet in first stage of labor, 153
 in puerperal infection, 405
 in puerperium, 207
 Holmes, 390
 Home, cesarean section in, preparation for, 288
 from hospital, care after, 243
 labor at, care during, 162
 Home, labor at, preparation for, 120
 nursing *vs.* hospital nursing, 544
 Horlick's malted milk, 532
 Hospital, home from, care after, 243
 nursery of, care in, 545
 nursing, economy in, 548
 handling of orders, 547
 prevention of accidents in, 546
 recording of symptoms in, 546
 relations to patient, 548
 vs. home nursing, 544
 orders, 547
 preventing epidemics among infants in, 228
 ward care in, 544
 Hot water and alcohol method of sterilization of hands, 559
 Hot-water bags, complications of infancy due to use of, 479
 Hubbell's prepared wheat, 532
 Hygiene of pregnancy, 90
 applied, 119
 Hygienic nursing bottle, 533
 Hymen, 37
 Hyperemesis gravidarum, 338
 care of mouth in, 344
 classification of, 339
 diet in, 341
 duodenal feeding in, 597
 nourishment in, 341
 prevention of decubitus in, 344
 psychotherapy in, 341
 symptoms, 339
 termination of pregnancy in, care after, 343
 treatment of, 339
 Hypodermoclysis, 313
 instruments for, 314
 needle, 314
 Hysterotomy, 286
 ICE, application of, in ophthalmia neonatorum, 467, 468, 469
 meat-extract, 593
 Ice-bags in treatment of mastitis, 431
 Icterus neonatorum, 87, 458
 Ideal drinking glass, 342
 Identification of newborn infant, materials for, 182

- Identification of newborn infant,
 method of, 182
 Imperforate anus, 475
 Imperial granum, 532
 Impetigo contagiosa in infants, 459,
 460
 Impregnation, 48
 Impressions, maternal, 103
 Inanition fever in newborn, 447
 Incisions, Duehrssen's, 278, 279,
 327
 Incubator, 488
 ambulance, 492, 493
 Auvard, 488
 bed, 495
 care of, 493
 clothes-basket made into, 487,
 488
 diet in, 498
 feeding in, 501
 heating, 488
 Hess electric, 503
 keeping feet warm in, 497
 moisture of, 494
 removal from, 506
 station, 489
 of Chicago Lying-in Hospital,
 489
 ventilation of, 488, 494
 Indigestion in infant, 443
 in premature infant, 508
 Induction of premature labor, 326
 balloon method, 321
 indications for, 321
 instruments for, 323
 Krause's method, 321
 methods of, 321
 Infant, asepsis in care of, 223
 baptism of, 285
 bathing, 224
 Bednar's aphthae in, 448
 blue, 452, 509
 Bohn's nodules in, 449
 borborygmus in, 231
 bowels of, care of, 230
 bronchitis in, 451
 buttocks of, care of, 232
 care of, 223
 after operative delivery, 270
 by visiting nurse, 540
 in puerperal infection, 403
 carrying, 242, 243
 castor oil for, 230
 chafing in, 459
 chafing in, treatment, 460
 circumcision of, 454
 preparation for, 455, 456
 colic in, 444
 treatment of, 444
 colonic flushing for, 231
 conjunctivitis in, treatment, 230
 constipation in, 445
 convulsions in, 477
 coryza in, 451
 cyanosis in, 452
 delayed separation of cord in, 463
 urination in, 453
 diaper of, 233
 diarrhea in, 446
 diet of, 238
 digestive organs of, affections of,
 443
 dilatation of prepuce in, 457
 disorders of first weeks of life, 443
 eczema intertrigo in, 460
 treatment, 460
 erythema in, 459
 eyes of, care of, 229
 feeding, 512
 additions to, 528
 artificial, 521
 barley, rice, wheat, or oatmeal
 water, 533
 breast. See *Infant, nursing of.*
 buttermilk, 530
 cereals, 529, 534
 certified milk, 529
 complementary, 520
 condensed milk, 532
 dried milks, 532
 eggs in, 529
 evaporated milk, 531
 farinaceous foods, 532
 formula, preparation of, 526
 rules for writing, 524
 goat's milk, 533
 lactic acid milk, 530
 malted foods, 532
 milk foods, 532
 pasteurized milk, 530
 protcin milk, 531
 S. M. A., 532
 supplementary, 520
 technic of, 527
 vegetable purée, 535
 soup, 534
 vitamins, 535
 fetal development of, 52

- Infant, fever in, 238
 fresh air for, 241
 granulations of navel in, 463
 green stools in, 447
 growth and development, 535
 hernia in, 476
 home from hospital, 243
 impetigo contagiosa in, 459, 460
 in uterus, position of, 57
 inanition fever in, 447
 indigestion in, 443
 layette of, 130
 lockjaw in, 477
 marasmus in, 450
 melena in, 447
 menstruation in, 462
 mouth of, infections of, 469
 navel of, care of, 228
 newborn, 85. See also *Newborn infant*.
 nursery care of, 545
 nursing of, 234
 activity of breast, 516
 after patient is up, 221
 amount of feedings, 238, 239, 241, 517
 complementary feeding, 520
 contraindications to, 515
 difficulty in, 234, 444
 intervals for, 234, 519
 length of time for, 235, 519
 overfeeding, 520
 position for, 519
 proper position for, 201, 220
 supplementary feeding, 520
 technic of, 518
 underfeeding, 520
 when to put to breast, 234
 oil rubs for, 227
 operative injuries, 470
 overfeeding at breast, 520
 overgrowth in, diet for prevention of, 591
 overlying, 479
 pemphigus in, 459, 460
 treatment, 461
 pharyngitis in, 469
 phimosis in, 454
 pneumonia in, 451
 premature. See *Premature infant*.
 preventing epidemics among, 228
 pulse of, 241
 putting to breast, time for, 234
- Infant, pyelitis in, 470
 pyloric stenosis in, 445
 respiration of, 241
 respiratory tract of, affections of, 451
 scales for, 133, 241
 skin of, affections of, 458
 snuffles in, 451
 sore buttocks of, 449
 eyes in, 229, 465
 sprue in, 448
 starvation fever in, 238
 syphilitic skin infection in, 459
 temperature of, 241
 tetanus in, 477
 thirst fever in, 238
 throat of, infection of, 469
 thrush in, 448
 tongue of, cleansing, 234
 training of, 243
 underfeeding at breast, 520
 urinary organs of, affections of, 453
 urination in, 233
 urine of, uric acid in, 233, 454
 vesicular eruptions in, 459
 visitors to, 223
 vomiting in, 445
 vulvitis in, 462
 wardrobe of, 130
 wasting in, 450
 water requirements, 514
 weighing, 240
 wet-nurse for, 239
 wounds of, 271
- Infantibus, 235
- Infection, auto-, 391
 nasal, in premature infant, 508
 of eyes, 465
 of mouth and throat, 469
 of newborn, 463
 of umbilicus, 464
 puerperal, 387. See also *Puerperal infection*.
- Infectious cases, asepsis of obstetric nurse after, 136
- Inflammation of bladder in pregnancy, 336
 in puerperium, 413
 of breast, 429
- Infusion, rectal, in puerperal infection, 399
- Inguinal hernia in infants, 476
- Injuries, operative, of newborn, 470

- Injuries to brain in birth, 473
 Inlet of pelvis, 28
 Innominate bones, 27
 Insanity, puerperal, 415
 nourishment in, 417
 prevention of suicide in, 416
 procuring sleep in, 417
 symptoms, 416
 treatment, 416
 Instruments, care of, after operations, 270
 for cesarean section, 292
 for embryotomy, 284
 for filling colpurynter, 322
 for forceps operation, 277, 279
 for hypodermoclysis, 314
 for induction of premature labor, 323
 for perineorrhaphy, 175, 176
 for pubiotomy, 303
 for treatment of abortion and curetage, 324
 preparations of, for operations, 268
 sterilization of, 563
 Internal examination at labor, preparation for, 149
 Interspinous diameter, taking, 551
 Intestinal colic mistaken for labor pains, 135
 Intramuscular administration of medicines, 355
 Intraperitoneal cesarean section, 294, 295
 Intravenous administration of glucose, 318
 of salt solution, 314, 317
 treatment, continuous, 600
 Involution, 80
 of uterus, 68, 78
 Iodin in preparation for labor, 146
 for vaginal examination, 150
 Iodism, 589
 Iodoform gauze, 568
 Irrigation of eyes in ophthalmia neonatorum, 467, 468
 Ischuria paradoxa in pregnancy, 336
 in puerperium, 83, 212
 Itching of pudenda in pregnancy, 333
- JACKET, confinement, 125
 Jaundice in newborn, 87, 458
- Jelly, T. G. C., preparation of, 579
 Wharton's, 52
 Junket, 593
- KELLY pad, paper, method of making, 263
 preparation of, 573
 Kidneys in pregnancy, 107
 in puerperium, 83
 of newborn infant, 88
 pains in, in labor, 72
 Kielland's forceps, 273
 Kite-tail tampon, 570, 581
 Knee-chest position, 340
 Koumiss, 593
 Krause's method of inducing premature labor, 321
- LABIA majora, 36
 minora, 37
 Labor, 68
 after-pains, 79, 408
 among destitute, care during, 537
 analgesia in, Gwathmey's synergistic, 194
 scopolamin-morphin, 197
 anesthesia in, 187
 chloroform, 190
 ether, 168, 189
 ethylene, 192
 nitrous oxid and oxygen, 191
 articles needed for, 122
 sterilization of, 123
 asepsis during, 135
 of nurse during, 393
 preservation of, 153
 at home, care during, 162
 bag of waters in, 73
 before doctor's arrival, 368
 care after, 199
 during, 135
 at home, 162
 changes in position after, 200
 collapse in, 265
 complications during, 368
 conduct of, by nurse in absence of physician, 368
 danger signs in, 135
 date of diagnosis, 115
 delirious mania in, 378
 dropping as sign of, 70
 drum, contents of, 580

- Labor, dry, 70
 exhaustion in, prevention of, 137
 false pains of, 70
 first stage of, 70, 72
 bowels and bladder in, 152
 care during, 136
 determining advancement of
 head, 157, 158, 159
 diet in, 152
 general instructions, 155
 history sheet in, 153
 preparation for abdominal
 examination, 148
 for doctor, 147
 for external examination,
 148
 for internal examination,
 149
 for rectal examination,
 149
 for vaginal examination,
 149
 of bed for, 140
 of patient for, 142
 of room for, 138
 preserving asepsis during,
 153
 summary of nurse's duties,
 160
 when to summon doctor, 157
 flooding after, 380
 full bladder during, 152, 155
 headache during and after, 186
 hemorrhage during, 379
 high stomach after, 94
 prevention of, 94
 in ancient Egypt, 184, 185
 jacket for use at, 125
 kidney pains in, 72
 laceration of sphincter ani at,
 38
 length of, 71
 lightening as sign of, 69
 mania in, 378
 materials needed for, 122
 sterilization of, 123
 menses after, appearance of, 221
 mortality of, 17
 nurse on guard during, 137
 nursing during, 135
 operations at, 258. See also *Op-
 erations.*
 pains, 71, 72
 false, 135
- Labor pains, intestinal colic simu-
 lating, 135
 passages of, 71
 passengers of, 71
 period of dilatation, 70
 powers of, 71
 premature, 68, 358
 causes of, 359
 induction of, 321
 balloon method, 321
 indications for, 321
 instruments for, 323
 Krause's method, 321
 methods of, 321
 premonitory symptoms, 69
 preparation for, 136, 162
 antiseptics in, 146
 at home, 120
 methods of, 146
 presentations and positions in,
 245
 prolapse of cord at, 375
 protection of perineum in, 369
 restraining, 369
 room for, arrangement of, 163
 preparation of, 121
 rupture of bag of waters as
 sign of, 70
 of uterus in, 379
 satchel of visiting nurse, 537, 538
 second stage of, 71, 73
 administration of ehloro-
 form in, 190
 of ether during, 168, 189
 bearing down during, 167
 care during, 160
 complications to be guarded
 against, 160
 cramp in leg during, 160, 161
 general instructions for
 nurse, 162
 marking infant, 169
 positions for, 165, 166
 rectal discharges during, 167
 severing the cord, 169
 spiritual challenge of, 162
 summary of duties, 171
 shock in, preparation for, 265
 show as sign of, 70
 signs of, 135
 soiled linen after, care of, 186
 stages of, 70
 suggestibility of patient at, 189
 technic in specialized nursery, 183

- Labor, test of, 557
 third stage, 71, 77
 air-embolism in, 175
 care after, 186
 during, 171
 ergot in, 174
 expelling placenta in, 173
 guarding uterus during, 172
 hemorrhage during, 173
 lacerations of perineum in, 174, 177
 palpation of uterus to determine its hardness after, 171, 172
 perineorrhaphy in, 175
 pituitrin in, 174
 summary of duties during, 178
 time of getting up, 219
 uterine contractions in, 72
 uterus in, 71
 vagina after, 80
 visiting nurse during, 537
 vulva after, 80
 Laceration of perineum, complete, special care in, 205
 in third stage of labor, 174, 177
 repair of, 307
 of sphincter ani during delivery, 39
 Lactation, 68, 81
 Lactic acid milk, 530, 531
 Lambdoid suture, 56
 Lamp, electric, for sore buttocks, 449
 formaldehyd, for fumigation, 575
 treatment of cracked nipples, 428, 429
 Lanugo, 485
 Laparotomy drums, contents of, 581, 582
 Laparotrachelotomy, 295
 Large fontanel, 56
 Lavage of bladder, 413
 Layette, infant's, 130
 Leg, cramp in, during labor, 160, 161
 milk, 407
 Leggings, sterilization of, 574
 Lemonade, egg, 592
 Leukorrhœa in pregnancy, 108, 332
 Liebig foods, 532
 Life, feeling, as sign of pregnancy, 114
 Ligaments, broad, 35
 Ligatures, living, 77
 Light for cesarean section, 292
 for operations, 268
 Lightning as sign of labor, 69
 Lineæ gravidarum, 64, 65, 66
 prevention of, 95
 Linen bobbin for tying cord, sterilization of, 573
 soiled, after labor, care of, 186
 suture yarn, sterilization of, 573
 Liquid diet, 590
 in agalactia, 437
 Liquor amnii, 51
 at term, 55
 cresolis compositus, 578
 Lithopedion, 357, 364
 Lithotomy position, 266
 modified, 265
 Little's disease, 474
 Liver of fetus, 60
 Living ligatures, 77
 mode of, in pregnancy, 91
 Lobes of breast, 39, 40
 Local anesthesia, 198
 changes in pregnancy, 62
 Lochia, 79
 amount of, 80
 cruenta, 79
 decidua in, 80
 odor of, 80
 purulenta, 80
 sanguinolenta, 79
 serosa, 80
 Lockjaw in infant, 477
 Lucs, 588
 Lungs in pregnancy, 65
 Lutein, 42
 Lysol gauze for tamponade, 566
 solution, preparation of, 578
 MAGNESIUM sulphate, intramuscular administration of, 355
 Major operations, 271
 Malt preparations in agalactia, 437
 Malted foods, 532
 Mammary glands, inflammation of, 429
 Mammillaris, 203
 Mania, delirious, in labor, 278
 in puerperium, 416
 Marasmus, 450
 Marriage, advice of nurse at, 112

- Martin's trephine, 284
Mask of pregnancy, 65
Massage in puerperium, 215
 of breasts in agalactia, 438
 in engorgement, 421-423
 of premature infant, 506
Mastitis, 429
 Bier's congestion treatment, 435
 causes of, 430
 glandular, 429
 ice-bag treatment, 431
 parenchymatous, 429
 phlegmonous, 429
 symptoms, 430
 treatment, 431
Maternal changes in pregnancy, 62
 impressions, 103
Maternity boxes, 126
 Center Association of New York City, 128
 specialized, technic in, 183
Mattresses, sterilization of, 574
Mayo sponges, 565
Measurements, pelvic, 116
Meat cure, 593
 diet, raw, 593
Meat-extract ice, 593
Meatus urinarius, 36, 37
Meconium, 61, 87
Melancholia in puerperium, 416
Melena, blood transfusion in, 319
 neonatorum, 447, 470
Mellin's food, 532
Menopause, 47
 symptoms of, 47
Menses, appearance after labor, 221
 cessation of, as sign of pregnancy, 114
Menstrual anomalies, 47
 cycle, 45
Menstruation, 44
 cessation of, 47
 changes in mucosa of uterus during, 45
 duration of flow, 46
 in newborn infant, 89, 462
 interval between periods, 46
 nature of discharge, 46
 profuse, and flow between periods, significance of, 47
 relation of ovulation to, 46
 symptoms of, 46
 uterus during, 45
Mensuration, pelvic, 549
Mental changes in puberty, 43
 condition in puerperium, 83
 conflicts in young mother, 217
 diseases in puerperium, 415
 treatment in puerperal infection, 401
Mercurialization, 589
Mercurochrome in preparation for labor, 146
 for vaginal examination, 150
Mercury bichlorid solution, preparation of, 577
Mesnard-Stein bone forceps, 284
Metabolism in pregnancy, 99
 of fetus, 58
Metric-avoirdupois chart for babies, 601
Michaëlis' rhomboid, 552
Miliaria, 459
Milk, abnormal, 440
 albumin, 531
 and egg, 594
 as food, 512
 baby, 529
 breast, amount of feedings, 517
 chemical examination of, 521
 compared with cow's milk, 522
 factors which influence, 517
 ideal food for infants, 515
 quantity of, 517
 carbohydrate in, 514
 casein in, 513
 certified, 529
 vitamin D, 530
 condensed, 532
 diet, absolute, 590
 digested with acid, 594
 dried, 532
 drying up, 441
 Eiweiss, 531
 evaporated, 531
 excess of, 435
 expressing from mother's right breast, 236
 fats in, 513
 flow, stimulation of, 437
 foods, 532
 formula, preparation of, 526
 rules for writing, 524
 goat's, 533
 human and cow's, differences in composition, 522
 lactic acid, 530, 531

- Milk, malted, 532
 modification of, 523
 theoretical basis, 523
 pasteurized, 530
 cold process, 594
 warm process, 594
 protein, 531
 proteins in, 513
 salts in, 514
 scarcity of, 436
 sterilized, 594
 stimulation of breast to increase, 240
 vitamins in, 514
 witches', 462
 Milk-fever, 82
 Milking of breasts, 237
 Milk-leg, 407
 Milk-shake, 594
 Milk-toast, peptonized, 594
 Milne-Murray's forceps, 274
 Mind during pregnancy, 101
 in puerperium, treatment of, 217
 Minor operations, 306
 Miscarriage, 68
 Modification of milk, 523
 Mohel, 454
 Moisture of incubator, 494
 Molding, 557
 Monilia albicans, 448
 Monochorionic twins, 257
 Mons veneris, 30, 36
 Monstrosities, 475
 Montgomery, tubercles of, 40
 Morbus caeruleus, 452
 Morning sickness, 67
 in diagnosis of pregnancy, 114
 Mortality from childbirth, 17
 Mother, care of, after operative delivery, 271
 by visiting nurse, 541
 daily care of, 201
 home from hospital, 243
 young, emotions of, 217
 Mouth, affections of, in infant, 448
 care of, in hyperemesis gravidarum, 344
 of newborn infant, care of, 168
 infection of, 469
 of premature infant, care of, 505
 Mucous membrane of birth canal, 34
 Mucus in throat of newborn, removing, 168
 Multiple pregnancy, 256
 Mushroom catheter, 413
 Mutilating operations, 283
 preparation for, 285
 Mutton broth, 594

 NAEGELÈ perforator, 284
 Narcysten, 193
 Nasal feeding, 599
 ensemble, 599
 infection in premature infant, 508
 Nausea of pregnancy, 330
 Navel of newborn, 87
 care of, 228
 granulations of, 463
 Needle, hypodermoclysis, 314
 pubiotomy, 304
 Neisser's gonococcus, 465, 587
 Nephritis, chronic, in pregnancy, 356
 eclampsia and, 356
 treatment, 356
 Nephrosis, pregnancy, 345
 Nervous breakdown in puerperium, 415
 system in pregnancy, 67
 Nestbuilding, 45
 Nestle's food, 532
 Neuralgias in pregnancy, 67
 Newborn infant, 55, 85
 asphyxia of, 479
 preparation for, 264
 atelectasis pulmonum in, 86, 180, 452
 blindness in, prevention of, 179, 466
 bowels of, 87
 brain injuries in, 473
 caput succedaneum in, 474
 cephalhematoma in, 474
 chafing in, 460
 treatment, 460
 congenital deformities in, 475
 constipation in, 445
 convulsions in, 477
 cry of, 86
 cyanosis in, 452
 delayed separation of cord in, 463
 urination in, 453

- Newborn infant, diarrhea in, 446
 disorders of first weeks of life, 443
 dressing cord, 179
 eczema intertrigo in, 460
 treatment, 460
 enlargement of breasts in, 462
 treatment, 462
 eruptions on skin of, 458
 eyes of, care of, 168
 infection of, 465
 first care of, 168, 178
 weeks of, 85
 foot-print records of, 181
 general care, 179
 granulations of navel in, 463
 hemorrhages in, 470
 hernia in, 476
 identification of, materials for, 182
 method of, 182
 inanition fever in, 447
 infected hangnails in, 459
 infections of, 463
 jaundice in, 87, 458
 kidneys of, 88
 length of, 55
 lockjaw in, 477
 marking, 169
 melena in, 447
 menstruation in, 89, 462
 molding of head of, 57
 mouth of, care of, 168
 infection of, 469
 mucus in throat of, removing, 168
 navel of, 87
 oiling of, 179
 operative injuries, 470
 overlying, 479
 physiologic changes in, 85
 putting to breast, 203
 pyelitis in, 470
 respiration of, 86
 severing the cord, 169
 skin of, 87
 affections of, 458
 sleep of, 86
 sore eyes in, 465
 stools of, 87
 syphilis in, signs of, 589
 temperature of, 86, 89
 tetanus in, 477
 throat of, infections of, 469
- Newborn infant, umbilicus of, infections of, 464
 urine of, 89
 uric acid in, 454
 vaginal discharge in, 89
 vulvitis in, 462
 weight of, 55, 89
 wounds of, care of, 182
 Newspapers, sterilization of, 566
 Night dresses, infant's, 131
 Nipple, 39, 40
 abnormalities of, 423
 areola of, 40
 secondary, 63
 blisters of, 425
 care of, 235
 in puerperium, 201
 cracks of, 425
 dry air treatment, 427
 remedies for, 429
 therapeutic lamp treatment, 428, 429
 fissures of, 425
 for babies with cleft palate, 475
 for nursing bottle, 527
 Nipple-shield, 235
 Wansbrough's, 426
 Ziegler's, 426
 Nitrate of silver for prevention of ophthalmia neonatorum, 179
 Nitrous oxid and oxygen anesthesia in labor, 191
 Nobel's warm box, 487
 Nodules, Bohn's, 449
 Non-protein diet, 591
 Nose of premature infant, care of, 505
 saddle-, in premature infant, 508
 Nourishment in hyperemesis gravidarum, 341
 in puerperal infection, 397
 in puerperal insanity, 417
 Nurse, articles needed by, 584
 as health teacher, 18
 asepsis of, 20
 care of, in ophthalmia neonatorum, 469
 delivery by, before doctor's arrival, 368
 deportment of, 585
 dress of, 585
 dressing forceps of, 584
 duties of, at cesarean section, 294

- Nurse, duties of, during forceps operation, 280
 in eclampsia, 348
 in extra-uterine pregnancy 366
 in placenta praevia, 359
 in postpartum hemorrhage, 381, 382
 in prenatal care, 113
 in preparation for labor at home, 120
 engagement of, 110
 in puerperal infection, 403
 obstetric, 583
 asepsis of, after infectious cases, 136
 instructions for, 123
 on guard during labor, 137
 in eclampsia, 354
 in prenatal care, 120
 opportunities of, in obstetrics, 18, 90
 spirit of service in, 20
 visiting, 537
 duties of, during labor, 537
 during puerperium, 540
 labor satchel of, 537, 538
 postpartum satchel of, 542
 wet-, care of, 441
 Nursery conveniences, 132
 hospital, care in, 545
 Nursing bottle, 527
 ancient, 534
 for premature infant, 500
 hygienic, 533
 during labor and puerperium, 135
 hospital, economy in, 548
 handling of orders, 547
 prevention of accidents in, 546
 recording of symptoms in, 546
 relations to patient, 548
 versus home nursing, 544
 infant, activity of breast, 516
 after patient is up, 221
 amount of feedings, 517
 complementary feeding, 520
 contraindications to, 515
 difficulty in, 444
 intervals for, 519
 length of time for each feeding, 519
 overfeeding, 520
 position for, 201, 220, 519
- Nursing infant, supplementary feeding, 520
 technic of, 518
 underfeeding, 520
 visiting, in obstetric practice, 537
 Nutritious coffee, 594
- OATMEAL water, 533
 Obstetric anesthesia, 187
 cases, list of articles for, 122
 complications, 329
 examination, preparation for, 306
 nurse, 583
 asepsis of, after infectious cases, 136
 instructions for, 123
 opportunities of, 18, 90
 operations, 258
 pads, 125
 palpation, 250
 Occipital presentation, 246
 four positions of, 247
 Occlusion of anus, 475
 Oil enema in pregnancy, 106
 for newborn infant, 179
 rubs for infant, 227
 Oleum ricini, administration of, in puerperium, 210
 Operations, 258
 anesthesia for, 269
 assistants at, necessity for, 261
 breech extraction, 281
 care after, 269
 of child after, 270
 of instruments after, 270
 of mother after, 271
 cesarean section, 286
 destructive, 283
 forceps, 271. See also *Forceps operation*.
 in private home, 262
 light for, 268
 major, 271
 minor, 306
 mutilating, 283
 preparation for, 285
 Porro, 287, 301
 positions for, 265, 266, 267
 preparation for, 259
 for complications, 264
 of instruments for, 268
 of patient for, 265

- Operations, preparation of room
 for, 262
 pubiotomy, 302
 responsibility of nurse in, 259
 of surgeon in, 258
 Sigault's, 302
 suitable table for, 261
 symphysiotomy, 302
 version, 282
 warm room for, 269
 Operative injuries of newborn, 470
 Ophthalmia neonatorum, 465
 application of ice in, 467, 468,
 469
 irrigation of eyes in, 467, 468
 precautions for nurse in, 469
 prevention of, 466
 argyrol for, 179
 Credè's method, 179
 in hospital nursery, 545
 protargol for, 179
 silver nitrate for, 179
 symptoms, 230
 treatment, 467
 Opisthotonos, 478
 Opportunities of nurse in obstetrics,
 18, 90
 Orders, 547
 Organized prenatal care, 128
 Os uteri, 34
 Ossa innominata, 26
 Osteomalacic pelvis, 32
 Outlet of pelvis, 29
 Ovary, 35
 function of, 41
 Overfeeding at breast, 520
 Overgrowth in child, diet for pre-
 vention of, 591
 Overlying the child, 479
 Ovulation, 41
 relation of menstruation to, 46
 Ovum, 48
 development of, after concep-
 tion, 50
 of six weeks, 51
 of three weeks, 50
 villi of, 50
 Ox-gall enema, 410
 Oxygen and nitrous oxid anesthe-
 sia, 191
 PACKER, gauze, tubular, 323
 Packing uterus with gauze, 308
 Packing vagina in postpartum
 hemorrhage, 382
 Pad, electric, 479
 Kelly, method of making from
 paper, 263
 preparation of, 573
 obstetric, 125
 Turkish, 566
 Pad-holders, 124
 Pains, after-birth, 77, 408
 after labor, 173
 bearing down, 72
 false, of labor, 70, 135
 in abdomen in pregnancy, 334
 kidney, in labor, 72
 labor, 71, 72
 intestinal colic simulating, 135
 Palate, cleft, 475
 nipple for babies with, 475
 Palfyn, Jean, 272
 Palfyn's forceps, 272
 Palpation, obstetric, 250
 of fetus in diagnosis of preg-
 nancy, 114
 of uterus to determine its hard-
 ness after delivery, 171
 Paper Kelly pad, method of mak-
 ing, 263
 Paralysis, Erb's, 472
 facial, after forceps delivery, 471
 Parenchymatous mastitis, 429
 Parietal bones, 56
 Pasteurized milk, 530
 Patient, changes in position of,
 after labor, 200
 first visit to physician, 113
 preparation of, for abdominal
 examination, 148
 for delivery, 165
 for external examination, 148
 for first stage of labor, 142
 for internal examination, 149
 for operation, 265
 for rectal examination, 149
 for vaginal examination, 149
 relations to, in hospital, 548
 Pelvic measurements in pregnancy,
 106
 mensuration, 549
 peritoneum, 36
 Pelvimeter, 147, 148
 Pelvimetry, 549
 Pelvis, bony, 25
 brim of, 28

- Pelvis, cavities of, 26, 29
 contracted, 31
 deformed, causes of, 30
 false, 26, 27
 flat, 31
 inlet of, 28
 normal, 25, 30
 osteomalacic, 32
 outlet of, 29
 quadrants of, 245, 246
 small, 27
 soft parts, 32
 true, 26, 27
 upper strait of, 28
 varieties of, 30
 Pemphigus in infants, 459, 460
 treatment, 461
 Pendulous abdomen in pregnancy, 334
 Peptic salt, 508
 Peptonized milk, cold process, 594
 warm process, 594
 milk-toast, 594
 Perforator, Naegelè, 284
 Periglandular cellulitis, 429
 Perineal body, 38
 Perineorrhaphy, 175, 307
 after-treatment, 205, 308
 instruments for, 175, 176
 removal of sutures after, 308
 Perineum, 36, 38
 excision of, 75
 lacerations of, complete, special care in, 205
 in third stage of labor, 174, 177
 repair of, 307
 protection of, during labor, 369
 Periods, menstrual, 44
 Peritoneum, 36
 Pernicious vomiting of pregnancy, 338
 Perspiration in pregnancy, 108
 Pessary, air, 320
 Petrolatum in constipation of pregnancy, 107
 Petticoats, infant's, 130
 Pharyngitis in infants, 469
 Phenol solution, preparation of, 577
 Phimosis in infants, 454
 circumcision in, 454
 dilatation in, 457
 Phlegmasia alba dolens, 407
 Phlegmonous mastitis, 429
 Physical changes in puberty, 43
 Physiologic changes in pregnancy, 64
 Piles, 39
 Pillow-slips, sterilization of, 574
 Piston syringe, 322
 Pitchers, sterilization of, 573
 Pituitrin in third stage of labor, 174
 Placenta, 51, 59
 at term, 52, 55
 delivery of, 76, 77
 Duncan's mechanism, 77
 expelling, in third stage of labor, 173
 praevia, 70, 359
 central, 360
 marginalis, 360
 treatment of, 359
 with colpeurynter, 361
 premature detachment of, 362
 Schultze's mechanism, 77
 Placental stage of labor, 71
 Plaster, adhesive, for varicose veins, 331
 Pledgets, 564
 Pneumonia in infant, 451
 cool bath in, 451
 wet-pack in, 451
 Podalic version, 282
 Point of direction, 246
 Poisoning, arsenical, 589
 Poisons, administration of, avoiding mistakes in, 547
 Polyuria in puerperium, 83
 Pomeroy's dilator, 320
 Poor, labor among, care during, 537
 Porro operation, 287, 301
 Position, 245
 abbreviation of, 247
 after third stage of labor, 186
 diagnosis of, 249
 for nursing infant, 201, 220
 for removal of sutures, 309
 knee-chest, 340
 lithotomy, 266
 modified, 265
 posterior, 254
 Sims' elevated, 377
 Trendelenburg, 377
 Walcher, for forceps delivery, 280

- Position, Walcher, modified, 267
 White, 397
 Posterior commissure, 38
 fontanel, 56
 positions, 254
 Postpartum abdominal binder, 221
 hemorrhage, 380
 after-care, 385
 causes of, 380
 duties of nurse, 381, 382
 preparation for, 264
 Sehrt's aorta compressor in, 384
 symptoms, of, 380
 treatment, 381-385
 visiting bag, 543
 Posture in pregnancy, 93
 Pounds, to change to grams, 601
 Pre-eclamptic diet, 591
 toxemia, 344
 Pregnancy, 62
 abdominal supporter in, 93
 acidosis in, 100
 alcohol in, 96
 appetite in, 67
 areolar signs in, 114
 Aschheim-Zondek test for, 115
 urine for, 119
 backache in, 336
 bathing in, 108
 blood in, 65
 blood-pressure in, taking, 116
 bowels in, 105
 Braxton-Hicks' sign of, 115
 breasts in, 63
 care of, 110
 support for, 93
 cervix in, 63
 cessation of menses as sign of, 114
 Chadwick's sign of, 115
 chronic nephritis in, 356
 treatment, 356
 constipation in, 67
 diet for, 106
 drugs for, 106
 oil enema for, 106
 psychotherapy, 106
 treatment, 105
 corsets in, 91, 93
 cystitis in, 336
 danger signals in, 127
 determination of sex in, 104
 diagnosis of, 114
 Pregnancy, diet in, 95
 suggestions, 97
 digestive tract in, 66
 disorders of, 329
 dress in, 91
 duties of nurse in, 113
 eclampsia in, 338, 345
 convalescence from, 354
 convulsions in, 345
 diaphoresis in, 352
 diet in, 354
 "dont's" in treatment of, 354
 French treatment, 347
 fresh air in, 352
 general nursing in, 348
 nephritis and, 356
 on guard in, 354
 prenatal care and, 338
 Stroganoff's treatment, 347
 symptoms, 345
 tongue injuries in, prevention of, 349
 treatment, 346
 curative, 347
 preventive, 346
 edema of extremities in, 330
 emotions in, 102
 engagement of nurse, 110
 enlargement of breasts as sign of, 114
 excessive salivation in, 66
 exercise in, 100
 extra-uterine, 363
 after-care, 367
 causes of, 365
 duties of nurse in, 366
 symptoms of, 366
 fainting in, 336
 fear in, 102
 feeling life as sign of, 114
 food allergy in, 100
 frequent urination in, 335
 fresh air in, 101
 fright during, 103, 104
 general changes in, 64
 genitals in, 62
 care of, 108
 Goodell's sign of, 115
 grave disturbances of, 337
 heartburn in, 335
 Hegar's sign of, 115
 hemorrhages during, 357
 accidental, 362
 hygiene of, 90

- Pregnancy, hygienic of, applied, 119
- ischuria paradoxa in, 336
 - itching of pudenda in, 333
 - kidneys in, 107
 - leukorrhea in, 108, 332
 - local changes in, 62
 - lungs in, 65
 - mask of, 65
 - maternal changes in, 62
 - impressions in, 103
 - metabolism in, 99
 - mind during, 101
 - minor disturbances of, 330
 - mode of living in, 91
 - morning sickness in, 67, 114
 - multiple, 256
 - nausea of, 330
 - nephritis in, 356
 - eclampsia and, 356
 - treatment, 356
 - nephrosis, 345
 - nervous system in, 67
 - neuralgias in, 67
 - opportunities of nurse in, 90
 - pains in abdomen in, 334
 - palpation of fetus in diagnosis of, 114
 - pelvic measurements in, 116
 - pendulous abdomen in, 334
 - pernicious vomiting of, 338
 - perspiration in, 108
 - physiologic changes in, 64
 - placenta praevia in, 359
 - posture in, 93
 - preservation of figure in, 94
 - pride of, 93
 - pruritus vulvae in, 333
 - quickening as sign of, 114
 - respiration in, 65
 - rupture in, 334
 - shock during, 103, 104, 339
 - shoes in, 92, 93
 - skin in, 65
 - syncope of, 336
 - teeth in, 66, 335
 - thrush in, 334
 - toxemia of, 107, 337
 - pre-eclamptic, 344
 - toxicosis of, 337
 - travel in, 101
 - tubal, 364
 - uremia in, 356
 - ureteritis in, 336
 - urinalysis in, 119
- Pregnancy, urine in, 65, 107
- uterus, 62
 - vagina in, 63
 - varicose veins in, 95, 330, 331
 - treatment, 331, 332
 - vomiting of, 330
 - pernicious, 338
 - vulva in, 63
 - Wassermann test for syphilis in, 118
 - weight in, 67
 - worry during, 101
- Premature detachment of placenta, 362
- infant, anemia in, 507
 - atelectasis pulmonum in, 486, 510
 - bath of, 504
 - blue spells in, 509
 - care of, 485
 - characteristics of, 485
 - convulsions in, 510
 - cyanosis in, 509
 - diaper of, 505
 - diet of, 498
 - dip for, 505
 - diseases of, 507
 - dress of, 496
 - early contrivances for care of, 486
 - eyes of, care of, 505
 - feeding, 501
 - dropper for, 500
 - gavage for, Tarnier's method, 501
 - general care, 495, 506
 - incubator for, 488
 - indigestion in, 508
 - loss of weight in, 486
 - marasmus in, 450
 - massage of, 506
 - mouth of, care of, 505
 - nasal infection in, 508
 - nose of, care of, 505
 - nursing bottle for, 500
 - removal from incubator, 506
 - saddle-nose in, 508
 - sprue in, 508
 - thrush in, 508
 - ulcerative rhinopharyngitis in, 508
 - labor, 68, 358
 - causes of, 359
 - induction of, 321

- Premature labor, induction of, balloon method, 321
indications for, 321
instruments for, 323
Krause's method, 321
methods of, 321
- Prenatal care, 111
abortion in relation to, 358
danger-signals in, 127
diagnosis of pregnancy, 114
of time of confinement, 115
duties of nurse in, 113
eclampsia in relation to, 338
first visit to physician, 113
necessity of, 111
objects of, 112
organized, 128
pelvic measurements, 116
preparation for labor at home, 120
taking blood-pressure, 116
temperature of patient, 118
urinalysis in, 119
Wassermann test for syphilis, 118
weight recording in, 118
visit, routine, of nurse, 126
- Preparation for labor, 136, 162
antiseptics in, 146
at home, 121
methods of, 146
of genitals for labor, 143
- Prepuce, dilatation of, in infant, 457
- Prescriptions, Harrison, 596
- Presentation, 245
breech, 246, 248, 254, 281
before doctor's arrival, 375
positions of, 248
Wiegand-Martin method in, 255
brow, 246
deep transverse arrest in, 278
diagnosis of, 250
engagement of presenting part, 254
face, 246, 248
occipital, 246
four positions of, 247
point of direction, 246
positions in, 247
shoulder, 246, 248, 256
transverse, 256
neglected, 284
- Presentation, vertex, 246
- Preservation of figure in pregnancy, 94
- Prickly heat, 459
treatment, 460
- Pride of pregnancy, 93
- Prolapse of cord, 375
- Protargol for prevention of ophthalmia neonatorum, 179
- Protein milk, 531
- Proteins in milk, 413
- Pruritus vulvae in pregnancy, 333
- Psychic influences in breast feeding, 518
- Psychotherapy in constipation of pregnancy, 106
in hyperemesis gravidarum, 341
- Ptyalism, 66
- Puberty, 42
advice of nurse at, 112
changes in generative organs in, 44
mental changes in, 43
physical changes in, 43
time of advent of, 44
- Pubes, 30
- Pubiotomy, 302
after-care, 303
instruments for, 303
needle, 304
stages in, 302
- Pudenda, 36
itching of, in pregnancy, 333
- Puerpera, 77
home from hospital, 243
immediate care of, 200
ward care of, 544
- Puerperal embolism, 407
fever, 387
infection, 387
asepsis of nurse in, 393
bedsores in, prevention of, 396
bowels in, 396
cause of, 388
disinfection after, 405
frequency and source, 390
giving vaginal douche in, 401
history, 388, 405
limitation of, 405
medical treatment, 399
mental treatment, 401
nourishment in, 397
prevention of, 392
rectal infusion in, 399

- Puerperal infection, sleep in, procuring, 401
 surgical treatment, 401
 symptoms, 394
 the child, 403
 the nurse, 403
 treatment, 395
 vulvar dressing in, 396
 insanity, 416
 nourishment in, 417
 prevention of suicide in, 416
 procuring sleep in, 417
 symptoms, 416
 treatment, 416
 thrombosis, 407
 Puerperium, 77
 abnormal milk in, 440
 abnormalities of nipples in, 423
 after-pains in, 408
 agalactia in, 436
 asepsis of breasts during, 394
 of nurse during, 393
 bed exercise in, 214, 216
 bladder in, 211
 bowels in, 82, 209, 410
 breasts in, 81, 201
 diseases of, 419
 care during, 199
 easara sagrada in, administration of, 210
 easor oil in, administration of, 210
 catheterization in, 212
 complications of, 387
 early, 200
 late, 215
 constipation in, 83, 209, 410
 cystitis in, 413
 daily care during, 201
 diet in, 207
 emotions and mental conflicts in, 217
 enema in, 210
 engorgement of breasts in, 419
 massage in, 421-423
 symptoms, 419
 treatment, 420
 excess of milk in, 435
 exercise in, 214, 216
 first care during, 200
 foods to avoid during, 209
 galactorrhea in, 435
 general changes in, 82
 treatment, 213
 Puerperium, genitals in, care of, 204
 headache in, 414
 history sheet in, 207
 ischuria paradoxa in, 83, 212
 kidneys in, 83
 loss of weight in, 82
 massage in, 215
 mastitis in, 429
 mental condition in, 83, 415
 mind in, treatment of, 217
 nervous breakdown in, 415
 nipple in, care of, 201
 nursing during, 135
 phlegmasia alba dolens in, 407
 polyuria in, 83
 rectovaginal fistula in, 411
 retention of urine in, 83, 211
 scarcity of milk in, 436
 skin in, 83
 sleep in, 213
 subinvolution in, 415
 time of getting up, 219
 tympanites in, 83
 tympany in, 409
 urination in, difficult, 211
 uterus in, 78
 vagina in, 80
 vesicovaginal fistula in, 411
 visiting nurse during, 541
 visitors during, 217
 vulva in, 80
 Pulse of infant, 241
 Pump, aspirator, for use at cesarean section, 290
 Punch, rum, 595
 Pyelitis in infants, 470
 Pyloric stenosis in infant, 445

 QUADRUPLETS, 256
 Queen's chloroform, 187
 Quickening as sign of pregnancy, 114

 RASHES, heat-, in infants, 459
 treatment, 460
 Raw meat diet, 593
 Recipes, 591
 Rectal discharges during labor, 167
 dumbbell, 409
 examination, preparation of patient for, 149

- Rectal feeding, 595
 infusion in puerperal infection, 399
- Rectovaginal fistula in puerperium, 411
- Rectum, 36
- Red gum, 459
- Rehfuß' duodenal tube, 598
- Rennin, 513
- Reproduction, function of, 41
- Reproductive system, anatomy and physiology of, 18
 changes in, in puberty, 44
 physiology of, 41
- Respiration, artificial, Byrd's method, 483
 Sylvester's method, 482
 in pregnancy, 65
 of newborn infant, 86, 241
- Respiratory tract of infants, affections of, 451
- Restitution, external, 75
- Resuscitation of asphyxiated infant, 481, 482
- Retention of urine in puerperium, 83, 211
- Rhinopharyngitis, ulcerative, in premature infant, 508
- Rhomboid of Michaëlis, 552
- Rice water, 533, 595
- Ridge's food, 532
- Robinson's patent barley, 532
- Room, arrangement of, for cesarean section, 289
 for labor at home, 163
 fumigation of, 575
 preparation of, for first stage of labor, 138
 for labor at home, 121
 for operations, 262
 warm, for operations, 269
- Rotation, 29
- Routine prenatal visit of nurse, 126
- Rubber gloves, sterilization of, 559
 DeLee's method, 560
- Rum punch, 595
- Rupture in pregnancy, 334
 of bag of waters as sign of labor, 70
 of uterus in labor, 379
 threatened, symptoms of, 379
- SACCHAROMYCES albicans, 448
- Sacropubic diameter, taking, 555
- Sacrum, 26
- Saddle-nose in premature infant, 508
- Sagittal suture, 56
- Salivation, excessive, in pregnancy, 66
- Salt, peptic, 508
 solution, administration of, 313
 instruments for, 314
 intravenous, 314, 317
 subcutaneous, 316, 317
 apparatus, 315
 in puerperal infection, 399
 preparation of, 317, 578
 rectal infusion of, by drop method, 399
 sterilization of, 578
- Salts in milk, 514
- Sanitary seat cover, 109
- Sarcomphalus, 463
- Satchel, labor, of visiting nurse, 538, 539
 postpartum, of visiting nurse, 543
- Saw, Gigli wire, 302, 304
- Scales for infant, 133, 241
- Scalp, wounds of, 182, 271
- Scarcity of milk in breast, 436
- Schultze's mechanism, 77
- Scissors, decapitation, 284
- Scopolamin-morphin analgesia, 197
- Secundines, 59, 77
- Sehrt's aorta compressor in postpartum hemorrhage, 384
- Semisolid diet, 591
- Semmelweis, 388, 389
- Septic abortion, 357
- Septicemia, 387
- Service, spirit of, in nurse, 20
- Sex, determination of, 50, 104
 time of impregnation in relation to, 50
 differences in children, 42
- Sextuplets, 256
- Shaving, 142
- Sheets, sterilization of, 574
- Shield, nipple-, glass, 426
 Wansbrough's, 426
 Ziegler's, 426
- Shirts, knit, infant's, 130
- Shock during pregnancy, 103, 104, 339

- Shock, preparation for, 265
 - prevention of, 138
- Shoes in pregnancy, 92, 93
- Shoulder hook, DeLee's, 284
 - presentation, 246, 248, 256
- Show as sign of labor, 70
- Sialorrhea, 66
- Sickness, morning, 67
 - in diagnosis of pregnancy, 114
- Sigault's operation, 302
- Silk, sterilization of, 572
 - waxed, sterilization of, 572
- Silkworm-gut, preparation of, 570
- Silver nitrate for prevention of
 - ophthalmia neonatorum, 179
- Simpson's forceps, 273
- Sims' position, elevated, 377
- Sinus lactiferus, 39
- Skin, disinfection of, for cesarean
 - section, 290
 - feeding through, 596
 - in pregnancy, 65
 - in puerperium, 83
 - of newborn infant
 - 87
 - affections of, 458
 - eruptions on, 458
- Skull, fetal, 56
 - at term, 57
- Sleep in puerperium, 213
 - of newborn infant, 86
 - procuring, in puerperal infection, 401
 - insanity, 417
 - twilight, 197
- Slings, version, 283
- S. M. A., 532
- Small fontanel, 56
 - pelvis, 27
- Smegma, 37
- Snuffles in infant, 451
- Social diseases, 586
 - service, 20
- Soda solution, 597
- Solutions, preparation of, 576
- Sore buttocks, electric lamp for, 449
 - of infant
 - 449
 - eyes in infant, 229, 465
- Soup, vegetable, for infants, 534
- Spasm, facial, 478
 - of hands, 478
- Specialized maternity, technic of
 - labor in, 183
- Specific disease, 588
- Spermatozoid, 48, 49
- Sphincter ani, 39
 - laceration of, during delivery, 39
- Sponge-bath for infant, 224
- Sponges, covered, 564, 565
 - Mayo, 565
- Sprue in infant, 448
 - in premature infant, 508
- Starvation fever, 478
 - in infant, 238
- Station, 249
 - four degrees of, 249
 - incubator, 489
 - of Chicago Lying-in Hospital, 489
- Stenosis, pyloric, in infant, 445
- Sterile urine, method of collecting, 414
 - water, preparation of, 576
- Sterilization, 123
 - by dry heat, 562
 - methods of, 557
 - of apartments, 575
 - of basins, 573
 - of bed-pans, 573
 - of brushes, 564
 - of catgut, 570
 - of douche-cans, 573
 - of dressings, 564
 - of furniture, 574
 - of gowns, aprons, leggings, towels, sheets, and pillow-slips, 574
 - of hands, 558
 - Ahlfeld's method, 559
 - Fürbringer's method, 558
 - usual method, 559
 - of instruments, 563
 - of linen bobbin for tying cord, 573
 - suture yarn, 573
 - of mattresses, 574
 - of newspapers, 566
 - of pitchers, 573
 - of rubber gloves, 559
 - DeLee's method, 560
 - of salt, 578
 - of silk, 572
 - of silkworm-gut, 570
 - of suture material, 570
 - of waxed silk, 572
- Sterilized gauze, plain, 567
 - milk, 594

- Sterilizers, 561
 Stitches, after-treatment, 308
 removal of, 308
 special care of, 205
 Stockings for labor, 125
 infant's, 132
 Stomach, high, 94
 prevention of, 94
 Stone child, 357, 364
 Stools of newborn, 87
 green, 447
 Strabismus, 478
 Strait, upper, of pelvis, 28
 Striae gravidarum, 64, 65, 66
 prevention of, 95
 Stroganoff's treatment of eclampsia, 347
 Strophulus, 459
 Subcutaneous administration of
 salt solution, 316, 317
 Subinvolution in puerperium, 415
 Submammary abscess, 430
 Suggestibility of patient at labor,
 189
 Suicide, prevention of, in puerperal insanity, 416
 Supplementary feeding, 520
 Suture material, preparation of,
 570
 yarn, linen, sterilization of, 573
 Sutures of fetal skull, 56
 removal of, 308
 Sylvester's method of artificial
 respiration, 482
 Symphysiotomy, 283, 302
 after-care, 303
 bed, 305
 bed-frame, 304
 Symphysis pubis, 30
 Symptoms, recording, in hospital
 nursing, 546
 Syncope of pregnancy, 336
 Synergistic analgesia, Gwathmey's,
 193
 Syphilis, 588
 as contraindication to nursing
 infant, 516
 in newborn infant, signs of, 589
 innocent, 590
 prevention of contagion, 589
 stages of, 588
 transmission of, to infant, 588
 Wassermann test for, in preg-
 nancy, 118
 Syphilitic skin infection in infant,
 459
 Syringe, Asepto, 322
 Davidson's bulb, 322
 piston, 322
 TABLE, dressing, for infants, 133
 sterilization of, 574
 suitable for operations, 261
 Tampon, kite-tail, 570, 571
 Tamponade, lysol gauze for, 566
 uterine, 308
 gauze for, 569
 Tarnier's forceps, 274
 method of gavage for prema-
 ture infant, 501
 Tea, beef-, 592
 with acid, 592
 flaxseed, 593
 Tears, complete, of perineum,
 special care of, 205
 Teeth in pregnancy, 66, 335
 Temperature of infant's bath, 227
 of newborn infant, 86, 89, 241
 taking, in prenatal care, 118
 Term, 51, 55
 Test of labor, 557
 Aschheim-Zondek, for preg-
 nancy, 119
 Tetanus in newborn infant, 477
 T. G. C. jelly, preparation of, 579
 Therapeutic abortion, 326
 in hyperemesis gravidarum,
 343
 lamp treatment of cracked
 nipples, 428, 429
 Thirst fever in infants, 238
 Throat, infection of, in newborn,
 469
 Thrush in infant, 448
 in pregnancy, 334
 in premature infant, 508
 prevention of, in hospital nur-
 sery, 545
 Toast, milk-, peptonized, 594
 Toast-water, 595
 Toilet seat covers, sanitary, 109
 Tongue of infant, cleansing, 234
 prevention of injuries to, in
 eclampsia, 349
 Tongue-tie, 476
 Toothpicks, cotton-wrapped, 126
 Towels for infant, 133

- Towels, sterilization of, 574
 Toxemia of pregnancy, 107, 337
 pre-eclamptic, 344
 Toxicosis of pregnancy, 337
 Tracheal catheter, 480
 Training of infant, 243
 Transfusion, blood, direct method, 319
 in hemorrhagic diathesis, 319
 in melena, 319
 indirect method, 319
 preparations for, 318
 Transverse presentation, 256
 neglected, 284
 Travel in pregnancy, 101
 Tray, nursery, 133
 Trendelenburg position, 377
 Trephine, Martin, 284
 Triplets, 256
 True pelvis, 26, 27
 Tubal pregnancy, 364
 Tubercles of Montgomery, 40
 Tuberculosis as contraindication to nursing infant, 515
 Tuberosities, taking distance between, 556
 Tubes, fallopian, 34
 Tubular gauze packer, 323
 Turkish pads, 566
 Twilight sleep, 197
 Twins, 256
 diagnosis of, 257
 dichorionic, 257
 monochorionic, 257
 percentage table of, 256
 Two-basin method of collecting urine, 414
 Tying umbilical cord, 374
 Tympanites in puerperium, 83
 Tympany in puerperium, 409
- ULCERATIVE rhinopharyngitis in premature infant, 508
 Umbilical cord, 51, 52
 cutting, 169, 373, 374
 delayed separation of, 463
 dressing, care of, 179, 228
 daily inspection of, 225
 prolapse of, 375
 tying, 374
 linen bobbin for, 573
 hernia in infants, 476
 Umbilicus, infection of, 464
- Underfeeding at breast, 520
 Upper strait of pelvis, 28
 Uremia in pregnancy, 356
 Ureteritis in pregnancy, 336
 Ureters, 35
 Urethra, 35
 Uric acid in urine of newborn, 89, 233, 454
 Urinal, glass, 453
 Urinalysis in pregnancy, 119
 Urinary organs of infant, affections of, 453
 Urination, delayed, in newborn, 453
 difficult, postpartum, 211
 during first stage of labor, 152
 frequent, in pregnancy, 335
 in infant, 233
 Urine, examination of, during pregnancy, 119
 for Aschheim-Zondek test, 119
 in pregnancy, 65, 107
 of infant, uric acid in, 233, 454
 of newborn, 89
 retention of, in puerperium, 83, 211
 sterile, method of collecting, 414
 two-basin method of collecting, 414
 Uterine contraction in labor, 71, 72
 curetage, 312
 douche, 312
 tamponade, 308
 gauze for, 569
 lysol gauze for, 566
 Uterus, 32
 at term, 51
 atony of, postpartum hemorrhage due to, 380
 cavity of, 34
 cervix of, 34
 during menstruation, 45
 fundus of, 34
 in puerperium, 207
 guarding, in third stage of labor, 172
 height of, postpartum, 78
 in labor, 71
 in pregnancy, 62
 in puerperium, 78
 involution, 68, 78
 os of, 34
 packing of, with gauze, 308

- Uterus, palpation of, to determine
 hardness, 171, 172
 physiology of fetus in, 58
 position of fetus in, 57
 rupture of, in labor, 379
 threatened, symptoms of, 379
- VACUUM bottle used as irrigator, 400
- Vagina, 34
 after labor, 80
 discharge from, in newborn, 89
 in pregnancy, 63
 packing, in postpartum hemorrhage, 382
- Vaginal cesarean section, 301
 douche, 311
 arrangement for giving, 402
 in postpartum hemorrhage, 382, 383
 drum, contents of, 582
 examination, preparation for, 149
- Varicose veins in pregnancy, 95, 330, 331
 treatment, 331, 332
- Vegetable purée for infants, 535
 soup for infants, 534
- Venereal diseases, 586
 general consideration of, 590
- Venesection, 319
 in eclampsia, 321
- Ventilation of incubator, 488, 494
- Vernix caseosa, 54, 87
- Version, 256, 282
 Braxton-Hicks, 282
 cephalic, 282
 indications for, 282
 podalic, 282
 slings, 283
- Vertex presentation, 246
- Vesicovaginal fistula in puerperium, 411
- Vesicular eruptions in infants, 459
- Vestibule, 37
- Villi, chorionic, 59
 of ovum, 50
- Viosterol, 535
- Visit, routine prenatal, of nurse, 126
- Visiting nurse, 537
 duties of, during labor, 537
 during puerperium, 540
- Visiting nurse, labor satchel of, 537, 538
 postpartum satchel of, 542, 543
- Visitors, 223
 during puerperium, 217
- Vitamin D milk, 530
 certified, 530
- Vitamins, 595
 in diet in pregnancy, 96
 in infant feeding, 535
 in milk, 514
- Vomiting in infant, 445
 of pregnancy, 330
 pernicious, of pregnancy, 338
- Voorhees' dilator, 320
- Vulva, 34, 36
 after labor, 80
 dressing of, during puerperium, 204
 in puerperal infection, 396
 in pregnancy, 63
 itching of, in pregnancy, 333
- Vulvar dressings, preparation of, 566
- Vulvitis in infant, 462
- WALCHER position for forceps delivery, 280
 modified, 267
- Wansbrough's nipple-shield, 426
- Ward care, 544
- Wardrobe of infant, 130
- Warm box, Nobel's, 487
 process peptonized milk, 594
 room for operations, 269
- Wash clothes for infant, 133
- Wassermann test for syphilis in pregnancy, 118
- Wasting in infants, 450
- Water, albumen-, 591
 barley-, 591
 egg-, 591
 gum-arabic, 593
 requirements of infant, 514
 rice-, 595
 sterile, preparation of, 576
 toast, 595
- Waters, bag of, 73
 functions of, 73
 rupture of, as sign of labor, 70
- Waxed silk, sterilization of, 572
- Weaning, 441

- Weighing of infant, 240
Weight in pregnancy, 67
 loss of, in premature infant, 486
 in puerperium, 82
 of newborn infant, 55, 89
 recording in pregnancy, 118
Weights, avoirdupois and metric,
 comparative table of, for babies,
 601
Wet-nurse, 239
 care of, 441
 diet of, 442
Wet-pack in pneumonia in infant,
 451
Wharton's jelly, 52
Wheat, Hubbell's prepared, 532
 water, 533
Whey, 595
 champagne, 592
 wine, 595
White gum, 459
White's position, 397
Wiegand-Martin method of de-
 livering after-coming head, 255
Wine whey, 595
Wire saw, Gigli, 302, 304
Witches' milk, 462
Worry in pregnancy, 101
Wounds of newborn infant, care
 of, 182, 271
 of scalp, 182, 271
YARN, linen suture, sterilization
 of, 573
ZIEGLER's nipple-shield, 426
Zweifel cranioclast, 284
 forceps, 274





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